# DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

FACILITIES MAINTENANCE IN THE U.S. NAVY

BY

JOSEPH C. BRITAIN

NM228-85-6-3323

A REPORT PRESENTED TO THE GRADUATE COMMITTEE OF THE DEPARTMENT OF CIVIL ENGINEERING IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ENGINEERING

UNIVERSITY OF FLORIDA

This document has been approved for public release and sale; its distribution is unlimited.

SUMMER 1986

SELECTED AUG 2 2 1996

#### ABSTRACT

The main purpose of this paper is to examine the various aspects of Facilities Maintenance Management of Shore Activities in the U.S. Navy. Included also are some references to Marine Corps installation operations and maintenance as it differs from the Naval side.

The paper will show the operational areas that maintenance management is composed of (planning, execution, and appraisal) as well as the details of the structural organization tasked to administer the maintenance function (Public Works Department for the Navy and Marine Air Bases, Facilities Maintenance Office for Marine Corps Ground Activities). Numerous excerpts from Naval Facilities Maintenance Instructions are included as appendices to help further detail the maintenance operational procedures and forms management.

In the final chapter, the writer examines various aspects of service contracts as they apply to accomplishing the maintenance function. More commonly known as Facility Support Contracts, they encompass far more than the standard garbage collection or grounds maintenance tasks of years past.

It must be noted that this paper does not establish facilities maintenance or service contract policy; furthermore, it does not necessarily reflect the views of

the Navy. It there are any conflicts between this paper and the Naval Facilities Management Instructions, Marine Corps Orders, or the Naval Facilities Contracting Manual (P-68), then those applicable reference instructions are to be followed.

Al



# TABLE OF CONTENTS .

			Page
Chapter	I	Introduction	1
Chapter	II	Planning Phase of Maintenance	5
		Divisional Facility Maintenance	
		Management Responsibilities	
Chapter	III	Planning Phase of Maintenance	17
		A. Work Generation	17
		B. Work Classification	23
		C. Work Input Control	30
		D. Job Order Preparation	36
Chapter	IV	Maintenance Execution	
		A. Shop Scheduling	43
		B. Shop Performance	48
Chapter	V	Appraisal and Quality Assurance	49
Chapter	VI	Summary of Service Contracts	53
Appendi	ses.		68
٨.	Facil	ities Maintenance Organization -	69
	Marin	e Corps	
в.	(1) M	inor Work Procedure	72
	(2) S	pecific Work Procedure	78
	(3) L	evel of Haintenance Codes	80
c.	BEST	System	82
D.	Labor	Class Codes	87

E.	(1) Work Authorization/ Estimate	90
	(2) CPM Application	92
	(3) Job Order Phase Calculation Sheets	107
	(4) Job Order Preparation Instructions	114
F.	(1) Job Schedule	118
	(2) Work Center Labor Hour Availability	120
	Log	
	(3) Master Schedule Board	122
G.	Report Requirements	126
н.	Maintenance Management Appraisal	139
	Questionneine	

## CHAPTER I

#### INTRODUCTION

- A. Background. The expression Facility Maintenance Management (FMM) has many wide interpretations. In many cases the FMM effort ranges from variations in the processing of work orders to a complete absence of any control whatsoever. At times, the FMM process suffers due to a lack of funding support for the overhead costs, that includes inspectors, planners and estimators, and work reception. Experienced Maintenance Managers have seen these problems. The point here is that the system described in this report does not have universal acceptance in the Navy; in fact, from activity to activity, many organizational differences can be found. However, when the system is used properly, it will achieve better maintained facilities at a lover cost to the command.
- B. <u>Objectives</u>. The objectives of the maintenance management system are to maximize use of available resources through the following means:
  - 1. Increased torkforce productivity.
- 2. Provide a consistent and proper level of maintenance to all shore facilities.
  - 3. Reduce Maintenance Costs
- 4. Provide appropriate response to command requirements.

- C. <u>Precepts</u>. The Navy's Facility Maintenance Management system is based on several "maxims" or precepts:
- 1. Maintenance and Repairs (M&R) are less costly if caught in their incipient stages; therefore, the system should find and generate M&R instead of waiting for it to appear as a customer request or an emergency call.
- 2. Enough money is never available to accomplish all the M&R; therefore, a consistent system of job priorities, based upon operational considerations and maintenance standards, should be used.
- 3. The planning and programming of the activity's maintenance effort (Maintenance Control) is not the job of the shop's supervisors or the Maintenance Division Director.

  A separate staff organization is needed to determine what will and will not be done and when to do it.
- 4. Maintenance Management should view and analyze the maintenance effort after work performance, both in terms of individual job performance and maintenance division productivity as a whole. (1-6.9)
- D. <u>Functional Breakdown</u>. The Facilities Management System translates the above objectives and precepts into a simple set of procedures aimed at increasing maintenance productivity through the use of a Planning Phase, an Execution Phase, and an Appraisal Phase. For a better

understanding, these three phases can be further subdivided as follows:

- 1. Planning Phase
  - (a) Work Generation
  - (b) Work Classification
  - (c) Work Input Control
  - (d) Job Order Preparation (Planning & Estimating)
- 2. Maintenance Execution
  - (a) Shop Scheduling
  - (b) Shop Performance
- 3. Appraisal Phase
  - (a) Appraisal
  - (b) Quality Assurance (1-6.10)

These three functional areas are covered in the subsequent Chapters III, IV, and V. To understand how these functions are carried out, a basic understanding of the Maintenance Management organization is required; therefore, the components of the organization are detailed in Chapter II.

E. Maintenance Contracting. Since enough resources are never available to accomplish all the required M&R, the economics of this situation have resulted in the use of the private (commercial) sector to stretch the maintenance "dollar". The tool here is a service contract and it allows the maintenance manager to apply his limited in-house manpower

where it is most needed. Further, the savings achieved through contracting makes the Maintenance and Repair budget go much further. In many cases, the use of contract performance vice an in-house effort has resulted in some problems; consequently, this area must have special management and administrative requirements. These various requirements are briefly covered in Chapter VI, Summary of Service Contracts. (1-6.26)

F. Appendices. Several charts, forms, and procedural material are reproduced as appendices at the end of this report to support and further detail the material presented in the following chapters.

#### CHAPTER II

# PUBLIC WORKS DEPARTMENT - DIVISIONAL FACILITY MAINTENANCE MANAGEMENT RESPONSIBILITIES

The Public Works Department (PWD) is the shore facility component tasked to perform the maintenance function. The associated divisions within the PWD responsible for Facilities Maintenance are detailed in the following sections: (2-2,3)

- A. Maintenance Control Division (MCD)
- 1. <u>Concept</u> Planning and estimating is most successful if all maintenance work is processed initially through a specified unit of the PWD that plans, estimates, and programs the work. This unit is the MCD, or the Facilities Management Engineering Division (FMED) at some activities.
- 2. Maintenance Control Division Functions This unit is responsible for the preparation of the long-range maintenance plan, inspection, work reception and control, planning and estimating, and determining when engineering assistance is required. For maintenance work and by direction of the Public Works Officer, the Maintenance Control Director can authorize job orders within specified limits. MCD also prepares estimated standing job orders for typically a twelve month period and additionally specifies preventive maintenance inspection (PMI) frequencies. For work performed through service contracts, the MCD will

usually prepare the contract specifications. MCD is usually divided into the following "subdivisions". (1-2.16)

# (a) Work Reception & Control Branch (WRCB)

This unit of the MCD handles screening, classifying, and recording all maintenance requests; controlling the processing of requests, inspection reports, job orders, and emergency/ service work authorization; typing job orders; and maintaining the inspection/ historical files.

# (b) Inspection Branch (IB)

The IB carries out the shore facilities inspection program through performance of public works and utilities inspections within assigned schedules. Included under this responsibility is the technical control of the Preventive Maintenance Inspection (PMI) for the shops forces; preparation of inspection reports reflecting the physical plant condition and related job orders to correct the deficiencies uncovered; and preparation of the Backlog of Maintenance and Repair (BMAR). Unless the IP functions are combined with the Planning & Estimating Branch, this branch is staffed with wage board inspectors.

# (c) Planning and Estimating Branch (P&EB)

(1) The PLES prepares manpower and material estimates, and compiles estimating information for improving estimation techniques on labor/ material costs.

(2) Responsibility for overall job planning and preparing work estimates, initiating and expediting job orders for work performed by the Public Works Maintenance division lies with the P&EB. This branch prepares the main part of the job order with the Financial Branch of the Administrative Division providing the accounting data. The Public Works Officer, or his Assistant, and the Maintenance Control Director can approve job orders.

# (d) Service Contract Branch

This branch is responsible for the preparation and inspection of Facility Support Contracts as well as certifying contractor invoices for payment. Contract administration, including advertising, receiving bids, awarding the contract, negotiating change orders, and paying the contractor is handled through the Officer In Charge of Construction; however, there are exceptions to this. Emphasis on the Commercial Activities (CA) Program has resulted in workload surge on this branch.

(1) Contract Preparation - In the firm bid procedure, contract preparation is normally accomplished as an initial step; however, many activities lack the in-house expertise to prepare service contract specifications. This situation is rapidly changing as more personnel are run through appropriate NAVFAC training courses. To support the

activities, NAVFAC is preparing Performance Work Statements (PWS) which provide a basic guideline for formulating contract plans and specifications. The activity is still responsible for tailoring these PWSs to their specific command needs.

(2) Contract Administration - NAVFAC has established within the OIC organization a new billet titled Service Contract Manager (SCM). The SCM is the position with responsibility for service contract management. He is either assigned to the contracts field office or to the activity in the service contract branch of the Public Works Department. Technical guidance is supplied from the EFD. After contract award, the SCM is the main point of contact with the contractor. His principal responsibility is to insure the contract runs smoothly and the purchased product is provided in accordance with the contract specification. If change orders become necessary, he processes them and makes a recommendation to the MCD or QIC, depending on the organization, to issue a change. If the contractor is having problems, the SCM recommends action to the MCD/ OIC involving time, money, quality, or safety and he coordinates. matters of contract interpretation with the contractor, contract specialist, and MCD/ OTC. The Quality Assurance Program (QAP) provides the SCM with the required information on contractor performance. Furthermore, the SCM has the

responsibility and technical control over the QAP. The SCM duties can be delegated to the Public Works Department (PWD) if mutually agreed between the DIC and PWD that adequately trained PW staffing is available. If the SCM is placed in the PWD, this branch is usually placed under the cognizance of the MCD. (1-2.17)

- (3) Inspection Insuring contractor performance through the QAP requires a Quality Assurance Evaluator (QAE) billet. The GAE serves as the "eyes and ears" of the SCM. This billet performs the contract inspection/ surveillance and reports directly to the SCM. The QAE is on the activity's ceiling and may be located in any of the PWD divisions or in a department other than Public Works; however, the position reports only to the SCM on service contract matters. Under the SCM or a Supervisory QAE, the inspector will prepare and implement a QAE Surveillance Plan. Activities requiring several QAEs usually establish a Supervisory QAE position. This position is an interface in the chain of command between QAE and SCM. At larger activities, the PWD may delegate some or all of the SCM duties to the Supervisory QAE depending on the Supervisory GAE's experience and the activity level of involvement with service contracts. (1-2.18)
- B. Maintenance Division (MD)
- 1. Division Size Generally, the operating maintenance

force should be sufficiently large enough to perform both regular and non-recurring maintenance. Construction, alterations, and major repair or maintenance may be accomplished through contract or in-house if the shop's forces are capable of performing the work.

- 2. Functional Responsibilities The MD responsibilities include the maintenance of all public works, utilities, and Family Housing. On some facilities, however, Family Housing work may be done by contract. Where authorized, the MD may also perform construction, alteration, and repair work, excluding contract work. As well as performing planned maintenance inspections (PMI) and emergency/ service work, the MD also handles utilities plant work not accomplished through the Utilities Division (UD). Additional tasks include grounds maintenance and upkeep, and all pest control operations.
- 3. Maintenance Division Components The MD components will vary depending on the activity type and size due to availability of certain shop skills (or lack thereof) within other activities on the installation. The grouping of shops into branches as detailed in the following paragraphs are only examples and may require some realignment locally to obtain maximum efficiency depending on respective shop size and availability of support from other shop resources aboard the activity. The following shop breakdown is one

possibility and can vary as required.

- (a) <u>Building Trades Branch</u> This unit includes the following trades: carpentry, painting, masonry, and riggers. Riggers may be placed in the Transportation Division depending on local conditions.
- (b) <u>Metal Trades Branch</u> The following trades are possible here: plumbing and pipe fitting, boiler maintenance, sheet metal, and machine.
- (c) <u>Electrical Branch</u> This branch can include high voltage lines, electrical communications and fire alarm, and refrigeration/ air conditioning.
- (d) General Services Branch If present, this unit may include: grounds and janitorial labor, refuse disposal, grounds structures (railroads, roads, etc.) and pest control. At smaller activities, this branch may be combined with the Building Trades Branch.
- (e) Emergency/ Service Branch This unit handles about 50%, or more, of all work on an emergency or service nature; consequently, this results in the other shops having more time for scheduled maintenance or construction and repair work.
- 4. Maintenance Division Administrative Support The staff of the MD can include clerical personnel, a maintenance scheduler, and various shop planners. The maintenance scheduler performs overall shop planning and scheduling at

the division level. The shop planners provide supplemental detailed planning at the work center level. Additionally, the shop planners should check incoming material to insure correct quantities and quality. Organizationally, the shop planners may be under the shop foremen or directly under the Maintenance Scheduler. (1-2.19)

# 5. Supervision of Maintenance Division

- (a) Shops Engineer This position directs and coordinates all matters pertaining to shops operations and for maintaining liaison between the Public Works Department and other units on shop related matters. At smaller activities, this position may be combined with the Assistant Public Works Officer or the Shops Superintendent.
- (b) Shope Superintendent This billet reports directly to the Shope Engineer or the Assistant Public Works Officer, depending on the activity size, on all operational and administrative matters. In addition, this position performs the following supervisory tasks: production and overhead control, job assignments for work centers, workmanship quality, material usage, personnel assignment, and personnel training for the various trades. (1-2.18)
- C. <u>Utilities Division</u> (UD)
- 1. <u>Functional Responsibilities</u> This division handles the operation of utility plants and distribution systems and the corresponding operator inspection, PMI, and service work for

power, heating, refrigeration, compressed air, and sewage treatment plants. Pumping stations and auxiliaries, water, steam, gas, electrical, and fuel oil distribution systems also fall under the cognizance of the UD.

- 2. Secondary Functions Responsibility for determining the need for maintenance, scheduling shut down time for availability of equipment/ systems for maintenance and overhaul, inspecting work in progress, and final acceptance upon work completion usually rests with the UD. The UD also provides needed assistance as requested for control inspections in specialized areas.
- 3. Staffing The UD is made up of the minimum number of utility trades personnel to accomplish the above responsibilities. Maintenance beyond the scope in paragraph 1, above, is recommended by the UD director and processed through the MCD for accomplishment by station forces in accordance with the NAVFAC instruction MO-321, Facilities Management, or contract. For work performed with station forces, the UD provides the technical experience as required with augmentation from the MD when additional resources are needed.
- 4. <u>Utilities Division Components</u> The UD component structuring varies with the activity type and size and depends on the degree to which utilities are generated and/or purchased. The following unit breakdown is one possible

divisional organization.

- (a) Generation & Distribution Branch This unit may contain steam, gas, electrical, and miscellaneous other utilities.
- (b) Potable Water & Waste Water Branch Water and sewage treatments are the principal functions in this unit. (1-2.20)
- D. Transportation Division (TD)
- 1. Functional Responsibilities This division has cognizance over all transportation and equipment services to all activity components. These duties include: operating base vehicles and equipment pools: operating passenger and freight transport systems; maintaining automotive, tactical, construction, railroad, fire fighting, and weight handling equipment. The TD also determines maintenance and repair required, schedules work, performs maintenance and overhaul, and inspects work in progress as well as that completed.
- 2. <u>Organizational Components</u> This unit normally consists of two branches: an Equipment Maintenance Section under a Superintendent or Foreman and an Operations Branch under a Senior Enlisted (military) person. The overall TD Director is responsible for organizing, planning, supervising, and coordinating work of the two branches. The major functions of the two branches are detailed below.
  - (a) Operations Branch This unit handles the following

functions:

- (1) Operates station bus systems for personnel movements.
- (2) Operates trucking system for intra-station movement of equipment and material. A limited amount of off-station shipping is also handled.
- (3) Provides equipment and operators for facilities maintenance functions as requested by the Maintenance and Utilities Divisions.
- (4) Assigns vehicles on a long term basis to station departments and other tenant activities.
- (5) Operates station motor pool and provides vehicles on a daily and trip basis.
- (b) Equipment Maintenance Branch This shop is responsible for the accomplishment of the following functions:
- (1) Plans and schedules all maintenance work to ensure efficient shop's loading and minimize equipment down time.
- (2) inspects and performs maintenance necessary to ensure safe and serviceable equipment in a cost effective manner.
- (3) Accomplishes all maintenance work as authorized on shop repair orders.
  - (4) Performs Quality Control Inspections to ensure

the safety and reliability of all maintenance completed. (1-2.20)

# E. Variations at Marine Corps Activities

As stated at the beginning of this section, the Public Works Department is usually tasked with facilities maintenance. Although the PWD at Marine Air Stations are like Naval Activities, the facilities maintenance function at ground activities is assigned to the Facilities Maintenance Officer, a Marine Engineering Officer, in accordance with the Marine Corps Order 11000.7B. (2-2.22) Facilities Maintenance Organization in the Marine Corps, as it differs from the Navy, is covered in the attached Appendix titled "Facilities Maintenance, Marine Corps". While there are some minor administrative as well as operational differences, all other aspects of Marine Corps Facility Maintenance are similar to Navy Facilities Maintenance, which is representative in the remainder of this report. Minor Differences will be covered with the corresponding area on the Navy side in subsequent chapters.

#### CHAPTER III

## PLANNING PHASE OF MAINTENANCE

#### A. Work Generation

Maintenance requirements are generated by customers, command (zone) inspections, and by the PWD through the Shore Facilities Inspection System (SFIS). Additional special inspections are performed on special facilities as required. 1. Customer Requests - These are either written requests or phone calls to the Work Reception Branch of MCD. Figure III-1 is one form of a work request used by customers for requesting service from the PWD. Generally, it is for a job over a certain level (usually work requiring over 16 manhours) and not of an emergency scope. Smaller job requests are sent in via a service call (see Figure III-2) form or over the phone. Emergency requirements are received by phone and recorded on the service call form. It is very important that the customers be trained in submitting work requests so they know how to acquire service from the PWD. (1-6.12)

2. Zone Inspections - Another method that produces work for PWD to accomplish is the Military "Zone" Inspection.

Typically, the discrepancy lists and corresponding reports of action taken on the discrepancies are maintained in the

WORK REQUEST (MAINTENANCE MANAGEMENT NAVFAC NITEIA 25 (REV. 1-60) S/M-0155-003-7310 Superveduce MAYBOCKS 2331	1		(PW IN No	Deptement see Instructions AVFAC MO-321)
Request	ur zee Instructions un Reie	rae Nide		
PART 1 -	REQUEST (Filled out by	Requester)		
RESEARCH DIVISION			50-0	187 MS. 101-84
1, 10				P REGUEST
PUBLIC WORKS DEPARTMENT	<u>.</u>			EST WORK START
	RFORMINGE OF YORK	······································		
JOHN DOE EXT. 419			7. SEETS	M/PLAN ATTACINED
L DESCRIPTION OF YORK AND AUSTIFICATION   Incliding location			Yes	
PARTITION OFF ROOM IN BUILDING NO				
N FUMBL CHARGEABLE		is signature (Requesting Of		•
(Filled out by Mainte	T II — COST ESTIMATE nonce Centrol Division if	entimeto requestad)		
RESEARCH DIVISION			12. 417HM	
13. COST ESTIMATE	IL METENPLAN ATTACHE	9		
a. Labor \$ 1,380	785	<u> </u>		
	† · · · · · · · · · · · · · · · · · · ·	B 2_ Hi Trate to Summer to Start in		on priority by
b. Material \$ 2,490		. SALED ON PROSENT WORKLOAD	. THE ME	
and/or Surcharge 1 400		PROSEAMNED TO START IN		IP
d. Equipment Rental/Usage \$		AUTHORIZED BY 15TH OF		AND FUNDS
e. Contingency 8 854	BILLEPROV	49. (See Reverse Side)		
1. 10TAL 8 5,124	is signed) JOH!	N EMITH		17. 0478 7/6/84
PART IN -	ACTION (Filled out by	(equester)		
18. AU INDRES A FRUM TO PROCEED IN A FRACTION (I how a line of subside interests of a state of		JA. HORN REQUESTED	oun.	☐ \$\$\\$\d_\$\areaum

Figure III-1 Work Request

	•		•
EMERGEN	CY/SERVICE WORK AUTH	ORIZATION	
NAVFAC 11014/21 (Rev. 6:75	) wa na.		
CHARGE NO.	1	2 CAME HO.	
1444444	111111 20510	1 1 2 142 3	•
ICC C C DATE NICO	W C C STO HAS		
	7   57   59   52   34   36   37   37   37   37   37   37   37		
		1	
THE SECTION OF MORE	WO	NI TOCATION	
<u>SICIALIBIATI NY</u>	TIGHTHANE IN CH	445	
ORIGINATOR PHONE	ALLIENIER (31)	<u>i</u> 6)	•
HATUM OF WORK	uater line lea	44:11.45· 181	
にたいシコ	DE STOCAGE THE	Ш	
		· · · · · · · · · · · · · · · · · · ·	
HOP COMMENTS			
	ed ores to	rue lamari	
Garrie			
مرددون مرددون	records	<i>F</i> . <i>G</i>	
	records	6	
figure Lo	rechedu		
Figure 1			
figure To		CRAPILMAN	
DATE STARTO DATE CO		CRAPILMAN	
2 DATE STARTO DATE CO		CRAPILMAN	
2 OATE STARTO DATE CO	SMPLETED W C C HAS USED () () () () () () () () () () () () ()	CRAPILMAN	
2 OANE STARMO DATE CO 2 77 1 2 2 77 1 2 77 1 1 1 1 1 1 1 1 1 1	SMPLETED W C C HAS USED () () () () () () () () () () () () ()	CRAPILMAN	
2 DATE STARMO DATE CO	SMPLETED W C C HAR USED  21 21 12 13 13 13 13 13 13 25 27 28 29  C HAR USED  C HAR USED  4 13 13 13 13 13 13 13 13 13 13 13 13 13	CRAPILMAN	

Figure III-2 Emergency/ Service Work Authorization

Administrative Office (Station Inspector's Office at Marine Corps Activities).

3. Shore Facilities Inspection System (SFIS) - The most efficient and effective method of generating work is continuous inspection as this procedure identifies hidden as well as visible problems. (1-6.12) The SFIS handles existing facilities and equipment. Deficiencies are identified and corrective action initiated to put the facility back into the required condition. If the SFIS is properly administered, the inspection process will usually spot deficiencies in the early development stages; consequently, the number of breakdowns along with repair costs should be lowered and a sufficient backlog of work (to allow effective work programming/ scheduling) is provided. This inspection program does not involve new construction, alterations, or improvements except where these additions might influence the maintenance level to be performed. Facilities inspection should necessarily be performed by personnel, with some corresponding trades expertise, who know the facilities to be maintained and the appropriate conditions standards. Facilities Maintenance Management is most efficient with available resources when the maximum portion of all repair work is generated from inspection. The SFIS is broken down into four main inspection types as detailed in the following paragraphs.

- (a) <u>Operator Inspection</u>. This inspection includes examination, lubrication, and minor adjustments to systems and equipment over which the PWD has cognizance. Specific details for inspections are usually covered in the standard operating procedures for the respective operator. Equipment breakdowns and deficiencies beyond the operator's capacity/ authority are reported to the corresponding supervisor and/ or to the Work Reception Branch (2-6.1)
- (b) Preventive Maintenance Inspection (PMI). This area of inspection involves examination, lubrication, minor repair and adjustments of facilities, systems, and equipment to which no operator is assigned. PMI handles items that, if disabled, could interfere with essential operations of a Naval/ Marine Corps activity, endanger life or property, or involve a high cost or long lead time for repair or replacement. While the Inspection Branch has the responsibility to determine what is inspected and the frequency involved, the shops' personnel generally carry out the PMI. Determinations of what and how often to inspect are normally made with advice from the shops personnel and using appropriate Navy and commercial publications. Breakdowns are reported, as soon as practicable, to the respective supervisor and/ or work reception branch for appropriate follow-up action. Deficiencies are reported to the Inspection Branch Manager, in the MCD, via the shop

inspector's supervisor. The Inspection Branch reviews reported deficiencies, initiates any required action, and during Control Inspection evaluates the PMI effectiveness.

(c) Control Inspection (CI). The CI is a facility examination, scheduled in advance, to determine the existing facility condition as compared to the required level of maintenance. The objectives of these inspections are as follows: to monitor adequacy of operator inspections and PMI; to achieve reductions in repair costs and breakdown frequency; to provide a well balanced work flow to allow effective planning and scheduling; to provide inspection service for facilities not covered by PMI or operator inspection; to eliminate over maintenance; to classify defects as to the hazard degree and serve as a basis for safety certification; and to provide better planning for labor utilization and material requirement determination. Control inspection is accomplished through Inspection Branch personnel or by Planning and Estimating personnel. Inspectors do not adjust or correct equipment problems; consequently, they report deficiencies to the Inspection Branch Manager and breakdowns to the cognizant supervisor or Work Reception & Control. When the Inspection Reports are completed, the Inspection Branch Manager processes the reports. The Maintenance Control Director (or Facilities

Management Engineering Director) reviews the Inspection

Summaries for acceptance, correction, or rejection with

corresponding work authorization where required. Control

Inspections are typically divided into structural/ building,

electrical, or mechanical as required by the respective

activity. (See Figure III-3 for an example of a Control

Inspection Report.)

4. Special Inspections. In addition to the station inspection program, a program exists for providing inspections that require specialized skills, tools, and/or equipment. Examples of these specialized inspections include, but are not limited to the following areas: airfield pavements, underground utilities, moisture in built-up roofing, underwater inspections, and unfired pressure vessels. This program is handled through the NAVFAC EFDs. These inspection results are combined with the Control Inspection findings to yield a composite facility condition for future maintenance programming. (2-5.2)

#### B. Work Classification

After the work requirement has been identified, it must be classified. Obviously, it is not practical or economical to manage a three hour service call with the same "attention to detail" as a major, 500 manhour minor construction or repair job. In addition, required work must not be held up on emergencies. All work, consequently, goes through an

DEIS CONTROL INSPICTION 7160 Admin. Bldg., Security 3/2 hrs H.E. Sneeps Replace 2 broken 6-light wood Carp casement sash, including astrugal on east side of bldg. Frame und casings in good condition -DO NOT REPLACE. Rouse existing hardware. Sash size: 1- 7/2" x 3'-2". Paint Prime and apply 2 coats white paint. 6-light - wood casement sask

TIGURE 6.5 TM PECTORS REPORT (NAVEAC 9 14011/38)

Figure III-3 Control Inspection Report

initial classification and screening process at the work reception branch. During this process, the work receptionist (trouble call desk) filters off illegal work, identifies emergencies for immediate action by the emergency/ service work center, and non-emergency service work (less then 16 manhours). Additional factors that determine appropriate classification are the funding types involved, job duration, repetitive nature, urgency, and customer type.

- 1. Work (Classification) Categories. All generated work is categorized into one of the areas detailed below.
- that require immediate action to prevent damage or loss of government property, restore disrupted essential services, and eliminate safety hazards. Until the emergency problem is solved, the emergency designation is assigned to the work. This work is typically charged against a job order established for emergency work for work less than 16 hours and against the proper facility cost account numbers for emergencies requiring over 16 manhours. If the emergency work can be planned and estimated prior to completing it, then a minor or specific job order should be used for requirements in excess of 16 manhours. (Minor and specific are defined in the next sections.) After the basic emergency problem is corrected, any additional work required

to finish correcting the situation should be processed according to the work involved. The initial emergency work is authorized on Emergency/ Service Work Authorization Form.

(See Figure III-2)

- (b) Service Work. This work category is relatively minor in scope and can be accomplished under 16 menhours and the current established dollar limit (most recently this limit was \$1000 but is subject to change). Service work is authorized on the Emergency/ Service (E/S Ticket).
- (c) Minor Work. Minor work is greater than that for an E/S authorization and less than that for a specific Job Order, which is typically forty manhours (or whatever the local activity cut off for minor work is). A minor job is planned and estimated with Engineered Performance Standards (EPS) if there is an applicable section. The costs are collected, with other similar jobs, against a standing job order rather than as individual jobs. This results in less paper work for the MCD. These authorizations are processed as detailed in Appendix B(1). This work is not used at Marine Activities. (2-4.1)
- (d) Specific Work. These specific job orders authorize the performance of a specific quantity of work. These jobs are planned and estimated using EPS (where possible); furthermore, they are scheduled and individually cost accounted for performance evaluation. An example of a

specific job is repair of a weather damaged roof. Large specific jobs are possible candidates for contracting out. Specific job orders are processed as outlined in Appendix B(2). Specific job orders are authorized for the following work types:

- (1) Jobs for other activities that are authorized by a Request for Performance of Work (NAVCOMPT Form 2275).
  - (2) Jobs exceeding the Minor Work limit.
- (3) Job orders issued to correct poor workmanship by Public Works personnel.
- (4) Each job not funded from Public Works funds and which the customer requires separate cost accumulation. (2-4.2)
- (e) Standing Job Orders. In this classification, all work of a repetitive nature is included where cost accumulations are required. These job orders (SJO) typically include the following details:
- (1) Complete specification of the work as broken down into distinct job phases (A job phase is any amount of work that can be accomplished by one craft without having to stop for another trade to perform some required element).
  - (2) Work Area location.
  - (3) Equipment types considered (in estimate).
  - (4) Labor hour estimate by job phase (using EPS).

- (5) Time interval the job order spans (month, quarter, or year).
  - (6) Proper accounting data.

Two types of SJOs are used: estimated and unestimated. The estimated SJO should include a work description, frequency cycle, and precise time and cost estimates. With estimating, realistic labor and material estimates are developed based on EPS, which yields a definite cost reduction. The unestimated SJOs cover the repetitive work that can not be estimated due to lack of historical data and EPS or the nature of the work. These unestimated types are issued as a fiscal document for recording total annual charges. Work that is service in nature should not be accomplished through an unestimated SJO. As an example, SJOs are not for replacing glass, clogged plumbing, or emergency repairs. Changes on an unestimated SJO are minimized in this way.

All SJOs are reviewed at least annually to determine the necessity of work authorized, specification completeness, adequate frequency for functions performed, reasons for labor hours variation from estimate, and the total maintenance force hour requirements. (2-4.3)

2. Revork. This work type is for correcting poor quality or defective work. Rework requests are initiated by customers, and PWD supervisors. After rework initiation, the requests

are then routed to the Maintenance Control Director. MCD and the Directors of the MD and UD jointly investigate the work and submit recommendations to the Public Works Officer, or his Assistant PWO. The PWO/ APWO decides the cause of the problem and takes appropriate action to prevent recurrence. Upon approval of the PWO, the MCD will prepare a specific job order to perform the rework. The processing of rework specific job orders is identical to other specific job orders except that the labor is classified under labor class code 40 (for rework). (Refer to Appendix D for a complete listing of all labor class codes.) (2-4.4) 3. Amendments to Job Orders. An amendment may re-open a closed job order or change a current one under execution. For an already closed job order, the amendment typically states that the original job order is closed along with the purpose for re-opening it, such as performing additional required work. If the amendment increases the estimate dollar total, it tabulates the previous total estimate together with the amount of increase or decrease and the amended total estimate. A standing, specific, or supplementary job order may be amended for various reasons. such as:

- (1) re-opening a closed job order,
- (2) modifying the technical specifications and plans,

- (3) increasing or decreasing the dollar estimate and/ or scope,
  - (4) changing the accounting classification,
- (5) or a combination of any of the above or other reasons.

Actual requests for amendments are initiated at any supervisor level in the Maintenance or Utilities Divisions and funneled through that respective director to the Facilities Management Engineering Division (or MCD). The request states all essential facts so the amendment can be issued and yet minimize any added investigation. The Director of the MCD reviews all such requests and also approves them, if so authorized, or makes appropriate recommendations to the PWO/ APWO for final approval on those where the supporting facts justify the action. (2-4.6)

- C. Work Input Control
- 1. Input Control Scope. Work input control provides
  planning and job status information from the work inception
  through completion. Included are the following functions:
  screening jobs for actual need, determining relative
  urgency, programming those requirements through the planning
  stages, authorizing the work, insuring a balanced work load
  for each work center, staying informed on each job's status,
  and insuring proper work completion. Work programming is an
  orderly process that balances jobs needed for daily activity

operations with priority work required for operations, repair urgency, or safety. Actual work prioritizing procedures assure high priority requirements are handled as quickly as possible. If the work is generated through inspection, required priorities are much easier to establish. (Determining priorities is discussed under Priorities later in this section.) Individual work categories are handled together as a unit. For example, minor construction is controlled typically by setting a total dollar amount for the fiscal year. This limit is fixed as some maximum percent of the total maintenance/ repair budget. The station planning board then prioritizes the work requests for final approval by the station Executive Officer. Maintenance and repair efforts are directed at the highest priority repairs on the highest priority facilities. This does not mean that some facilities go without maintenance; however, various facilities are maintained at different levels. maintenance level determinations are based on the respective activity's overall condition and mission.

2. Responsibility. Input control responsibility is tasked with the Facilities Management Engineering Director and subject to review and approval by the Public Works Officer. Required decisions must take into account resource availability and, at times, involve several PWD divisions.

While at large activities review of work input control is typically the responsibility of the Assistant Public Works Office, at small and medium sized activities the Public Works Officer may serve this task.

- 3. Work Reception/ Control Branch Functions. This branch of MCD screens, classifies, and records all incoming maintenance and repair work requests. The branch carries out the following tasks: controlling processing of work requests, job orders, and inspection reports. Additional functions include posting and maintaining job status/ work progress charts and keeping inspection/ work order/ historical files. This branch handles job order flows within the MCD and to the shops divisions. Besides the above functions, this branch handles corrections of work request errors and cross checks with inspection reports for need verification and to insure that the work has not already been planned for accomplishment. (2-7.1)
- 4. Maintenance Level Effort. Upon deciding that work should be accomplished within twelve months, the relative importance of a particular job to other known work must be established. Each activity facility is assigned a Level of Maintenance Classification Code (LMC) that relates the activity mission to the respective facility. This determines authorization and work programming priority. The LMC is of vital necessity to avoid wasting scarce resources

on equipment and facilities that are not completely mission oriented and required on a continuous use basis. Refer to Appendix B(3) for a listing of LMCs and corresponding classification characteristics. (2-7.2)

- 5. Work Performance Type. The Maintenance Control Director (or Facility Management Engineering Director) whether a job, or portion of it, is to be done through shop forces, military forces, or contract. This "method of performance" decision is based on the planned and current workload of the work centers involved, work urgency, shops' capability to do the proposed work, and whether the function has been contracted under the Commercial Activity Program. Shop force or contractual performance of the work involved influences the cost estimate nature, or whether one is required, and the authorizing documents.
- 6. Work Timing. Deferral of job order issuance may be necessary due to budget constraints, weather considerations, and work center capability. During idle off-peak seasons, maintenance of facilities and equipment is an important aspect of job planning. As an example, the air conditioning/ reefer shop typically performs A/C and refrigoration maintenance during the off-peak (winter) months in areas with hot summer weather. Due to known work backlog, it may be beneficial not to issue job orders immediately in an effort to promote uniform shops workload.

Before final job order approval and subsequent release to the shops for performance, the complete backlog of job orders is reviewed to determine any which may take priority over those currently being programmed for accomplishment. (2-7.5)

- 7. Work Assignment Priorities. To establish the relative importance of each job to all other work requirements, a priority assignment of some form is required. Manhour availability and funding limits usually do not allow the accomplishment of all required and desired work immediately; therefore, a work priority classification system allows scarce resources to be optimally targeted by defining a particular job's relative importance for planning purposes. The Maintenance Control Director assigns the priority to the preliminary estimate, which usually determines when that particular job is selected for final estimating. After the final estimate is complete, the original priority now influences the job placement into the schedule. A priority system allowing work classification based on major work scope and justification contains the following type classes:
- (a) <u>Mission Function</u> work required to accomplish the activity's mission.
- (b) <u>Prevention</u> work necessary to prevent significant facility deterioration through continual use.

- (c) <u>Safety</u> work required to prevent injury to personnel.
- (d) <u>Aesthetic</u> work needed to maintain or improve a facility's appearance. (2-7.6)
- 8. Automated Data Support (ADP) & Word Processing. All information generated from work input control can be stored for later use through ADP or word processing. This is a major part of the BEST automated system (Base Engineering Support. Technical) developed for Public Works. Refer to Appendix C for a description of the BEST program. (2-7.15) 9. Work Authorization Files. Work Reception and Control maintains these files for up to typically five fiscal years. Completed Specific Job orders and minor work orders are filed in issue sequence by date or by property number. Emergency/ Service Work authorizations are filed by building number in issue sequence. Periodic analysis of current emergency/ service and completed reports by the MCD should identify recurring maintenance or other problem areas. (2-7.16)
- 10. Job Order Termination. A completed job order indicates that the requirements as specified in the job order have been met, the quantity and quality of the job have been inspected and certified correct by the cognizant shops foremen of the Maintenance and Utilities Divisions, unused materials returned to shops stores, and the customer is

satisfied. Refer to Procedure Chart #8 of Appendix B(2) for completed job order processing. Closing out completed job orders promptly and correctly is an important part of maintenance management. (2-7.17)

## D. Job Order Preparation

The last two sections included methods for the Maintenance Control Director (same as the FMED) to classify the work type, decide which jobs to undertake, and which resources to use in the work's performance. For those requirements the MCD decides to accomplish, and with station forces, a "work plan" must be developed. This plan is the result of the planning and estimating process. This process determines estimates of manpower (time), material, money and most important the operational sequence required to do the job. (1-6.19) Jobs are usually broken into several phases with each phase composed of a number of tasks.

1. Job Planning. The job order states the work to be done, equipment and material required, phased sequence of work, and what crafts will do the work. Consequently, the phases comprising the job are described, and the applicable work centers are indicated for each phase. By listing phases in proper order of accomplishment, phases are less likely to be omitted; interrelations of various work centers are detailed; the shop planning and scheduling function is assisted in achieving better coordination; and shop planners

concerned with material procurement can decide more effectively when material availability will allow scheduling a job. (2-8.1)

- 2. Material Selection. Selection of appropriate materials to meet the particular job requirements is usually based on NAVFAC maintenance and operations technical publications, activity policy, fund limitations, federal standard specifications, planner experience, or other data. Under certain circumstances, a specific material requirement, specified by proprietary name, should include the justifying reasons to insure that unusable substitutes are not procured through the Supply Department.
- 3. Job Estimating. An estimate is an analysis of all known components of a proposed job and the resultant forecast of all related requirements (materials, manpower, etc.) needed to perform the work.
- (a) Proposed Work Scope. The P & E specifies the work to be done and which crafts are required for the respective job phases. A clear, concise, and brief description of the entire job is then entered under the description block of the Work Authorization Estimate (Maintenance Management), NAVFAC Form 11014/22. See Appendix E(1) for an example of this form. (2-8.2)
- (b) Job Phasing. This process involves breaking a job into parts corresponding to crafts, or within a respective

craft, where the planning and scheduling step requires a more detailed breakdown. Following this breakdown, each responsible Planner & Estimator (P & E), for the respective craft discipline, prepares a Job Phase Calculation Sheet for each phase tasked to the P & E. This Phase Sheet includes as attachments, where necessary, appropriate plans, specifications, sketches, and other required data. The P & E tasked with overall responsibility for the job order preparation collects all phase sheets, places them in the sequence of performance, and performs the overall estimate. The actual planning, or sequencing, of the job phases may use the Critical Path Method (CPM) for phase scheduling purposes. Refer to Appendix E(2) for a CPM application. prevent confusion at the shops level regarding work content and accomplishment, each job phase description should be simply written and clear as to the nature and scope of work to be accomplished. The final estimate, with the job phase calculation sheets and other supporting data detailed above, is forwarded via the Work Generation Branch to the Facility Management Engineering Division (FMED) Director for review and approval.

(c) Job Order Preparation. After FMED director approval, the estimate is routed to the Work Reception & Control Branch to log in the job and distribute it to the appropriate supervisors. The information contained on the

Job Order and attached Job Order Continuation Sheets. NAVFAC Forms 11014/22 and 11014/22A respectively, is essentially the same as on the estimate. The individual Job Phase breakdown and descriptions on the job order are exactly the same as on the Job Phase Calculation Sheets, NAVFAC 11014/23. Refer to Appendix E(1) for a Job Order Form NAVFAC 11014/22 and Appendix E(3) for a Job Order Phase Calculation Sheet. The individual work phases as set up on the job order are arranged in the sequence to be performed as determined in the initial planning steps. (Again, CPM can be very useful here in the timing of each phase within the overall respective job order schedule. > Comprehensive guidance for completing the forms NAVFAC 11014/22 and 11014/22A are contained in Appendix E(4). (2-8.3) 4. Techniques of Estimation. Reliable and accurate guidelines are required to estimate the maintenance effort, expressed in manhours required, necessary to accomplish a specific task. The P & E's accurate estimate provides this required guide. To formulate accurate task estimates, the P & Es usually use either of three estimating sources: experience, historical files, or predetermined time standards. P & E experience and historical files provides rough guidence on how much time the respective trades personnel used on prior work of similar nature and/ or scope. Predetermined time standards provide the means to

generate more accurate time estimates for specific tasks. Engineered Performance Standards (EPS) are predetermined time standards for specific trade tasks based on timed motion studies (an industrial engineering process). The EPS references are NAVFAC prepared and are available for about three-fourths of the M & R/ construction type work. Since the FMED evaluates deviations between estimated and actual manhours used, the more accurate EPS is a better and fairer method for the shops personnel involved.

5. Estimate Types. There are two types of estimates commonly used depending on the respective requirement. simplest is a scoping estimate using short, easy computations with unit cost information as cuidance. estimates are for work that would not be authorized or are for planning purposes only. Inspection generated items that can not be accomplished in the near future, projected maintenance, or items slated for contract performance are included as areas for scoping estimates. As an example repairs to a wooden frame structure might be based on prevailing overall costs per square foot cost of materials and labor. References used for this estimate are the Unit Price Standards, NAVFAC P-715.0. The final estimate is done for work analyzed in detail on a job plan. It is the most accurate estimate of manhours and material requirements with associated costs. The estimate is broken down by work

center in the sequence the various phases are performed, with a summary of work centers involved. Listing by sequence of the work segments reduces the chance of omitting required steps of the work to be done. Reference to the probable work flow, as through a bar chart or CPM, shows the interdependence of the various phases, and corresponding work centers, during the course of the job. (2-8.4) 6. Factors Influencing the Estimate. In the preparation of the final job estimate, several factors that have a major impact on resource requirements must be taken into account. Travel Time is required for necessary trips between the shop facility and the job site per worker per day. In addition, Preparation Time is applied for preparation and clean up in the shop and at the work site. The actual Work Performance Time is the manhours needed for actual craft work performance to complete the job order. The craft time for each job task as listed on the Job Phase Calculation Sheet is recorded to the nearest tenth of an hour. Delay time is personal, unavoidable, balancing, planning, and communication delays. For direct and indirect material requirements, material types and costs are specified with the shop planner having access to the quantity data used in calculating the estimated material costs. When required specialized equipment is not owned locally and can not be obtained without charge, then equipment rental costs from

commercial sources is included. If the job order is not issued within a reasonable time after completion of the final estimate, it should be reviewed and revised to account for more current labor and material costs. Any increase or decrease in scope due to the delay in job order authorization is incorporated. Overhead and surcharges are applied as necessary in accordance with the Navy Comptroller Manual, Volume III. (2-8.5)

- 7. Job Plan & Estimate Review. Job order impact on the facilities management and the shops is so important that the P & E Supervisor typically examines completed final estimates. This review involves the factors detailed below.
- (a) Accuracy. Technical descriptions and arithmetic calculations are checked as thoroughly as possible, time permitting.
- (b) <u>Completeness</u>. Review of the final estimate should insure no item or phase is omitted.
- (c) Clarity. The description should be clear and concise to all personnel. (2-8.6)

#### CHAPTER IV

#### MAINTENANCE EXECUTION

#### A. Shop Scheduling

After the decision is made to accomplish a job with station forces, the job is planned and estimated, and the job order is written, the specific work must be programmed into a specific month, or Shopload Plan, for physical accomplishment. This scheduling effort typically involves balancing workload requirements against shopload capabilities and other constraints. (1-6.19) Shops scheduling commits shops personnel in advance of execution to assure proper coordination of personnel, materials, equipment, and work site. The shop schedule is a carefully prepared advance plan that takes into account the overall amount of work required, availability of craft personnel to accomplish the work, materials and equipment, and the particular jobsite. Other factors considered are proper work phase sequence, proper craft sequence to perform the phases, and the optimal size work force to be tasked to perform those work phases. Adherence to a rigid schedule for all work is not practical and some flexibility must be provided. This required flexibility is achieved through a two-step system of Master Scheduling and Work Center Scheduling. Master Scheduling commits 75% of the shop's available manhours to specific job orders. This 75% is

reflected in both the Master and Work Center Schedules. The remaining 25% of available shop force manhours is scheduled for emergency/ service work and Minor Work Authorizations (if, the minor classification is used). This 25% is the cushion that provides the flexibility necessary to absorb urgent work or unforeseen emergencies that may occur. This 75-25% can be adjusted up or down if several important specific jobs interrupt the Master Scheduled Work or if a large emergency/ service (or Minor Work) authorization backlog develops in the work center. This 75-25% split is based on remaining manhours after deducting for fixed assignments (standing job orders, periodic inspections, etc.), leave, holidays, and other indirect or overhead time. (2-9.1)

1. Master Scheduling. This schedule procedure results in a coordinated plan for accomplishment of specific jobs typically with minor work included at some installations. It assigns work centers to specific work for distinct weekly periods. The Master Schedule should be changed only for major changes in job conditions or work scope; for major delays in delivery of material; or when the Master Schedule is interrupted for emergency conditions. Under the supervision of the Maintenance Division Director, the Master Scheduler (MS) sets up the Master Schedule. The MS may be located in the FMED (or MCD); however, the FMED is more

concerned with medium and long range M&R planning with the shops handling work execution. Close liaison and coordination is absolutely essential to assure long range planning and the Master Schedule are compatible. The MS develops the schedule on the Job Schedule, NAVFAC Form 9-11014/26, and then waits for notification of material availability from the shop planners. Material availability is not necessarily full material receipt. Once an estimated material delivery date is received from the Supply Department, the MS establishes tentative time slots when the work centers involved have sufficient personnel available to perform the work in accordance with the tentative job plan. All tentatively scheduled jobs are reviewed at the weekly scheduling meeting with required changes made so that each job schedule becomes the optimum plan for that specific job. Refer to Appendix F(1) for an example of a job schedule (NAVFAC 9-11014/26). A firm schedule is then posted on the Master Schedule Board and which all Work Centers stick to.

(a) Available Manhours. In preparing a tentative job schedule, the MS must know not only the total manhours available for scheduling from each Work Center but also those hours previously committed. The Work Center Labor Hour Availability Log is commonly used to determine personnel availability. It shows for each upcoming work week (five workdays per week) the total manhours available

for Master Scheduling in each Work Center and those hours already scheduled for each Work Center. Refer to Appendix F(2) for an example of this labor hour log. The manhours available for each Work Center is entered in the "Available LH" slot and as each job is scheduled, the hours committed for each Work Center are entered in the corresponding spaces in the log with periodic totaling of the actual and tentative scheduled hours. With this procedure, the MS can quickly determine the extent to which each Work Center is loaded in the upcoming weeks; consequently, he can ascertain when a new job may be scheduled or what changes must be made to coincide with revised starting or completion dates. (2-9.2)

(b) Master Schedule Board. (MSB) The MSB is centrally located where job status review takes place. It shows a job through the various stages of awaiting materials, awaiting scheduling, and the scheduled and actual progress for the job duration. It shows when job orders were issued to the shops as well as scheduled starting and completion dates. This "eliminates" those jobs that have been pending for an abnormally long period. The MSB should indicate at least four to six weeks scheduling, whether a job is ahead or behind schedule, total work scheduled for each Work Center per week, and, most importantly, schedule deviations (in

labor hours) to indicate that corrective action is required. See Appendix F(3) for an MSB example. (2-9.5)

2. Work Center Scheduling. (WSC) This schedule accounts for daily craft personnel work assignments for the following week; consequently, this is a daily and weekly operation. The Work Center Schedule Form, NAVFAC 9-1014/27, indicates the Specific Job Orders that receive work the following week and the labor-hours needed to be in accordance with the Master Schedule. After deducting for overhead and other fixed assignments, the Work Center Supervisor slates the totals for each job and other minor work (or emergency/ service work if applicable) into a daily plan to provide an assignment for all those remaining productive manhours available for each day of the following week. WSC requires close coordination among the Work Center Supervisors on a job to determine site availability, when a preceding craft phase is to be completed, and when following dependent phases can be started (as delineated in the job CPM). If a priority or emergency job is sent to a Work Center after the Weekly Master Schedule, then the smaller jobs, not the larger multi-craft specific job orders, should be interrupted to provide the needed personnel for that other imminently required job. This minimizes the impact on other scheduled job phases and the resultant required Work Center and Master Schedule changes.

As a result of daily jobsite visits, and due to other mitigating factors such as emergency leave or bad weather, it may be necessary to implement a schedule change. Before switching the labor force, the impact on other Work Centers must be checked and the proposed changes discussed with those respective Work Center Supervisors. Each Supervisor then adjusts the work Center Schedule appropriately. At the end of each day, Work Center Schedules should reflect work assignments for the following day. (2-9.12)

## B. Shop Performance

Even though Maintenance Management concentrates primary attention on achieving increased productivity through planning and estimating, inspection, and scheduling, this does not reduce the need for sound supervision and good work performance. Where the largest potential lies for efficiency and savings is at the work site. Furthermore, the most important and critical resource is the people performing the work. A supervisor, therefore, must take care of his people. He should provide positive and firm leadership and, at the same time, treat his subordinates with dignity. If the supervisor does this, when the "chips are down", those same people will be there when he really needs them!

#### CHAPTER V

#### APPRAISAL AND QUALITY ASSURANCE

A. Appraisal. Appraisal is a basic requirement of a management system in measuring performance; consequently, it is an important part of Facilities Maintenance Management in the Navy. Except for certain Marine Corps Activities, as detailed in Appendix A, the Public Works Officer is ultimately responsible for efficient and successful maintenance operations. The PWO assigns various responsibilities to his subordinates to carry out a multitude of management functions and delegates the corresponding necessary authority; however, he cannot delegate overall responsibility. If the Public Works Department is to operate successfully, the PWO must be fully informed on all important aspects of the maintenance operation. Management reports detailed in Chapter 10, Report Requirements, of MO-321 assist greatly in controlling and measuring the shops' maintenance effort. (Refer to Appendix G for a full copy of Chapter 10, MO-321.) 1. Facilities Management Appraisal Questionnaire Purpose. This checklist provides a method for monitoring the maintenance management system status. The areas of particular importance include Shore Facilities Inspection, Work Input Concrol, Planning and Estimating, Shop Scheduling, Actual Work Accomplishment, Maintenance

Resources, Management Reports, and other Miscellaneous

Areas. The questionnaire answers allow the responsible

managers to access reasons for deviations from programmed

expected results, and to follow up with the necessary

corrective actions. Refer to Appendix H for a full

reproduction of the Maintenance Management Appraisal

Questionnaire, as it appears in NAVFAC MO-321.

2. Appraisal Questionnaire Usage. How useful this questionnaire will be depends heavily on close cooperation and understanding between PWD organizational divisions involved both directly and indirectly with the questionnaire results. Management personnel attitudes influences whether the questionnaire's use is constructive or destructive, questionnaire can be a useful tool for improving cost efficiency and labor performance if it is used within a framework of complete objectivity and education. In addition, any analysis based on questionnaire results must reach all PWD components to maximize the usefulness. Every manager from the Public Works Officer down to the shop foreman and work leader should investigate those respective variances outside acceptable ranges and take the required corrective action. A questionnaire illuminating problem areas should stimulate the responsible manager to prepare an action plan to improve performance with short interval follow up "inspections" to monitor progress. (2-11.1)

### B. Quality Assurance For In-House Operations. (QA)

Substantial effort has been directed to quality assurance for Facility Support contracting. Under the Commercial Activities Program (CA), the government is required to comply with the same conditions of the contract if performance is accomplished with in-house forces. Even for non-CA work, it is good management to monitor performance. Since inspections performed are for the government and associated in-house personnel, inspections can be made on a weekly, bi-monthly, or monthly frequency depending if problem areas persist. Random inspections are excellent to assure objectivity and that sufficient records are made to accurately gauge the desired performance.

The Quality Assurance responsibilities vary from activity to activity depending on local management policy and the type and amount of work done in-house. The Work Management Branch, or other similar section, of the FMED is typically assigned in-house QA inspectional duties. This in-house function is related to performance factors, quality of end product, and responsiveness of service. It does not attempt to evaluate direct supervision of the function. The end result is specified in terms of product or service quality, improved customer relations, and cost effective services. Combined with the Maintenance Management Program, this function provides essential feedback to the appropriate

managers for all key areas of public works effort and not just to the Maintenance and Utilities Divisions.

#### CHAPTER VI

### FACILITY SUPPORT CONTRACTS IN THE U.S. NAVY

- I. General Information
- A. Responsibility

The Naval Facilities Engineering Command (NAVFAC) is tasked with the responsibility for authorization to perform the design, planning, development, procurement, construction, alteration, repair, and maintenance at all shore activities for the U.S. Navy. In addition to the authority above, this Command exercises technical control over the alteration, maintenance, and repair of public works and utilities. The repair of these facilities, when beyond the capacity of the local workforce, can be performed by contract. (3-1.3.1)

B. Definition - Facility Support Contracts (FSCs)

FSCs are contracts, financed out of Operations & Maintenance, Navy (OMN) or Naval Industrial Funds (NIF), with the purpose of accomplishing the maintenance or repair of real property facilities, vehicles, and equipment. These contracts are used to restore those same facilities to initial or usable condition through overcoming disaster, damage, wear and tear, deterioration, and to perform the required services to maintain facilities in an operable condition. FSCs are classified as maintenance construction

or maintenance service contracts depending on the work required.

- are FSCs which accomplish construction, which is defined by the Davis-Bacon Act as construction, alteration, and/or repair including painting or decorating of facilities. The Department of Labor (DOL) has final authority to determine if a contract involves construction as defined in the Act; furthermore, DOL has usually found in debatable cases that construction is involved. Neither DOD, Navy, or GAO has authority to prescribe if work is construction or not due to the statutory vesting of authority in DOL. (3-9.1.1) These contracts must include a Davis-Bacon wage rate determination (from DOL) and be supported by bid bonds along with the Miller Act performance and payment bonds. (3-9.1.2)
- 2) Maintenance Service Contracts. All FSCs not requiring construction, as noted above for MCCs, are defined as Maintenance Service Contracts (MSCs). These contracts include automotive and equipment repair, HVAC system maintenance, janitorial services, and minor repairs on as needed basis not involving continuous work, For example, spot painting damages on a house is service; however, painting the complete house is construction. Repairing a short section of damaged fence is service, but replacing a whole fence line is construction. All MSCs must include a

Service Contract Act wage determination (see below on wage laws).

# C. Contract Types

Several contractual strategies are used in maintenance and are discussed in this section.

- 1) Fixed Price Incentive (FPI) If a Base Operating Services Contract is required, where a contractor performs nearly all of the maintenance and operation services at an installation, a competitively awarded FPI contract may be requested through NAVFAC.
- 2) Fixed Price Contract (FPC) The firm, fixed price contract, whether lump sum or unit price, is preferred for all contracts. This contract provides a price not subject to adjustment by reason of contractor's cost experience in performing the work. The FPC places maximum risk on the contractor and maximum incentive to insure the employees perform efficiently.
- 3) Time & Materials In some repair contracts, the quantity of repair work can not be determined in advance so as to permit the bidding of a fixed price contract. In such cases, fixed unit price (time and materials) contracts are authorized. In this type of contract, a firm, fixed price is established per unit with the number of units to be procured left open. (3-9.1.2)

- 4) Open-End Contracts (OECs) Open-end contracts may be used for either MSCs or MCCs; however, both service and construction can not be included in the same contract. OECs may be either Requirement (RC) or Indefinite Quantity Contracts (IQC). The IQC is a fixed unit price contract and does not specify the total amount of work which the Navy requires or when such maintenance is required. The government, through this contract, can call for the work when needed. The bid documents establish a base amount of work for evaluation purposes which gives the contractor a basis for estimating overhead and mobilization costs in preparing the bid. To constitute valid consideration, the contract sets a base amount of work as a guaranteed minimum which will be ordered during the contract period. RCs are similar to an IQC except:
- (a) the government is obligated to order from the contractor, and no other source (unless the contract reserves the right to the government to use in-house employees), all services specified in the contract during the contract period.
- (b) the contract states that the government is not obligated to place any minimum orders.
- (c) a reasonable maximum quantity must be stated, on a per order and per contract basis, to guard the contractor against an unanticipated workload. (3-9.1.4)

## D. Wage Law Requirements

There are two basic statutes under which the DOL determines minimum wage rates. These are the Davis-Bacon Act and the McNamara - O'hara Service Contract Act. The determination of which rate applies is a duty vested solely with the DOL. (3-9.1.8)

- 1) Davis-Bacon Act (DBA) This statute requires that advertised specifications for all contracts over \$2000 for construction, alteration, and/or repair, including decorating and painting, of public works of the United States shall have a provision stating the minimum wages to be paid to various types of laborers and mechanics will be determined by the Secretary of Labor. DBA wage determinations are normally published in the Federal Register, on a geographic area basis, remaining effective until superseded. In the absence of a Secretary of Labor wage determination, no construction contract may be awarded and no bids should be opened. In some areas, a wage determination must be obtained specifically for each contract. The wage determination must be set out in the IFB and resulting contract; furthermore, incorporation by reference is not permitted.
- 2) Service Contract Act (SCA) The SCA requires that all contracts in excess of \$2500 for providing services in the United States through the use of service employees shall

contain a Secretary of Labor wage and fringe benefit determination. Contracts subject to the DBA are exempt. Unlike a construction contract, a specific SCA wage determination must be requested for each service contract. Out-of-scope work added to an existing contract also requires a new wage determination to apply for the additional work. As with the DBA, without a Secretary of Labor wage determination, or a response from the Secretary that no wage determination applicable to the specified locality and employee classes is in effect, no service contract may be awarded; therefore, no bids should be opened. The wage determination must be in the IFB and resulting contract documents; incorporation by reference is not permitted. (3-9.1.9)

# II. Enforcing Performance

# A. General Information

No contract may provide penalties for non-performance as appeal boards and courts hold these are legally unenforceable; however, a contract can provide a clause for liquidated damages, which is an agreement in the contract between the parties for the damages one party will suffer if the other fails to perform. These "liquidated damages" clauses result in compensation for the government for losses suffered and expenses incurred when work is not performed properly or not done at all.

### B. Inspection

- 1) The key to assuring satisfactory performance from a Facility Support Contractor is adequate government inspection through trained and qualified inspectors. The more prone a particular work type is to poor performance, the more important it is to assign an adequate number of inspectors familiar with the contract. Sporadic inspection with untrained personnel invites shoddy performance and results in legal insbility to deduct from the contractor.
- 2) In order to substantiate deductions, pursuant to the deductions and liquidated damages clauses as specified in Sec. 9-303 of the NAVFAC Contracting Manual, and have those deductions stand on appeal to the Armed Services Board of Contract Appeals (ASBCA), thorough documentation of unperformed or shoddy work is essential. The best documentation is daily factual reports prepared by the onsite inspectors describing the unsatisfactory work or the non-performance.
- 3) FSCs are really an extension of the in-house public works force. As such, the work typically performed by station forces is performed by contractor personnel and inspected by qualified personnel in the service contracts branch of the activity public works department. (3-9.3.1) Where MSCs are used at stations with no public works personnel and are not serviced by a Public Works Center, the

respective Engineering Field Division provides inspection through the local DICC/ ROICC office. (3-9.3.2)

C. Termination for Default

- 1) Unless a contractor completely abandons the work, a termination for default due to poor performance is extremely difficult to prove and sustain at the ASBCA or in the courts. This usually is due to the poor work quality not being well documented and is shown only in general comments of discontent from the tenant activity. Again as noted above, the best evidence is the Inspector Daily Reports. (3-9.3.4)
- 2) If a contractor has not been paid the full amount due under the contract for the work done, then adequate documentation to support the corresponding deductions is required to sustain a termination for default. All computations of deductions as per a liquidated damages clause must be accurate and in exact accordance with the contract's schedule of prices. Additionally, the inspector's reports documenting all poor or non-performance must be on file! (3-9.3.5)

# III. Negotiations

#### A. Change Orders

A change order is basically a negotiated sole source procurement; however, a change order within the scope of the contract and one outside the scope are handled differently.

In-scope change orders can generally be processed without obtaining additional authority from NAVFAC. The exception here is for change orders exceeding the original contract amount by 100% or, when the sum of all preceding change orders to date and the one proposed exceed the original contract price.

- 1) In-Scope Change Orders For FSCs, contract scope is the term for defining the extent of work as stated in the specification's general intention or description paragraphs for a specific bid item or items of work called for in the contract. Consequently, if a contract requires janitorial services in building "X", floor one, and it is determined that the same services are now required in the same building on floor three, this new requirement can usually be added to the existing contract in accordance with paragraph (A) above.
- 2) Out-of-Scope Change Orders Changes or additions that do not fall within the conditions of paragraph (1) above, are considered as out-of-scope; therefore, with the same contract for janitorial services in building "X" in force and it is later determined that the same services are required in building "Y", that work would be accomplished under separate contract. Adding out-of-scope work to an existing contract requires the procuring activity to obtain a new SCA Wage Determination for the added work. If the

contractor must pay different wages for identical work in different facilities, this can present substantial administrative problems for the contracts' office.

3) <u>Deductive Change Orders</u> (DCO) DCOs are the method used to eliminate work from the basic contract scope. Work determined to be unacceptable due to not meeting specifications is never a proper subject under the changes clause. (3-9.4.1)

#### B. Government Estimates

An independent government estimate of costs, in as great a detail as if the government is competing for the work, is prepared from the work scope for each proposed contract, modification, or change thereto.

# C. Price Proposal Evaluations

Before any change order over \$500,000 can be executed, the contractor by statute must provide cost and pricing data, certified by him to be current, complete, and accurate as of the date of agreement in price. Prior to negotiation, the Defense Audit Agency must audit the contractor's price proposal. The contractor's proposal consists of the following parts: direct and indirect costs, material costs, and profit. (3-9.4.2)

# IV. Performance Specifications (PSs)

# A. General Description

1) For FSCs, a performance specification may be more

appropriate for use than descriptive (detailed) specifications. Generally, a performance specification indicates the required results, verifiable as meeting specified contract oritoria, and does not include unhecessary material (or process) specifics or limitations. Contract requirements including durability, strength, system output, fire resistance, toxicity, etc., are designated in the specification. Unless proper NAVFAC approval is obtained, PSs are not written specifying a particular product or feature proprietary to a sole manufacturer. (3-3.4.1) Proprietary requirements in contracts are not used unless it is established that no alternate choice can meet the necessary function. PSs are written to allow any contractor to bid those jobs whose labor/ equipment meets the required work's functional, technical, and physical needs. (3-3.4.2)

2) The standard clause package for technical specifications (TS) is tailored for each specific contract. TSs detail the exact services required, and how/ when the functions are to be performed. The TS must be clear and concise as to what service is required and the frequency of performance. Any questionable areas in the manner of performance or level of maintenance must be thoroughly detailed as it is the governments' responsibility to state the precise requirement and not the contractor.

addition, a schedule should be provided so that services are performed at the time interval required. If the schedule is not provided, the contractor can use his own discretion in the servicing interval and this probably would not match what the government desires.

## B. Sources of Technical Specifications

TSs, general paragraphs, and sample bidding information are available through the EFDs of NAVFAC. Selected specifications are listed in NAVFAC P-34, "Design Criteria Used In Contracts For Public Works". The P-34, other Federal/ Military specifications, and Maintenance/ Operational manuals can be ordered from the U.S. Naval Publications & Forms Center, Philadelphia, Pennsylvania. (3-9.6.1) Army Real Property Maintenance Activity (RPMA) type specifications containing inspection checklists and technical clauses are maintained at NAVFAC and are available to activities upon request. In addition, each EFD of NAVFAC maintains various types of specifications for referral to requesting activities. (3-9.6.2)

### V. Contractor or In-house Performance

Facility Support Contracts are effective in accomplishing activity maintenance. The decision must be made whether to accomplish said maintenance with in-house forces or by a service contract. The following factors favor contractor performance.

- 1) Cyclic Work A portion or entire function is not performed over the entire year; consequently, it is uneconomical to retain in-house personnel or use people out of their specialty.
- 2) Investment Costs The frequency of work is not often enough to justify high priced equipment or tool costs to perform the job.
- 3) Availability of Skills Certain work requires an unusual or high degree of skill that can not be retained in-house.
- 4) Contractor Specialization As a result of high business volume and specialization, some contractors can provide a service less expensively than through in-house forces.
- 5) Workload Peaks Customer request timing and funding variables often cause workload peaks. Using contractors may smooth out the workload.

The following factors may favor in-house performance.

- 6) Work Specification Difficulty Some work is not very practical to specify intil the actual need arises.
- 7) Time Factors Certain types of work require prompt attention. Unless the activity already has a contract in effect allowing negotiation or specifying the particular type of work, in-house performance may be more timely.

- 8) Lack of Skills in the Private Sector Some parts of the country may lack readily available skills required to support a mission requirement in a timely, satisfactory, and economical manner.
- 9) Support for Other Functions Functions such as direct fleet support can be such an integral part of mission requirements that it is not desirable to obtain the service by contract.

Again, the above factors help determine if a function is performed in-house or by contract. (4-1 through 9 & 11, 2-3.3 & 4;

### BIBLIOGRAPHY

- 1. <u>Public Works Manual</u>, Naval School For Civil Engineer Corps Officers, June 1981.
- Facilities Management (NAVFAC MO-321), Naval Facilities Engineering Command, May 1985.
- 3. Contracting Manuel (NAVFAC P-68), Naval Facilities Engineering Command, February 1985.
- 4. Service Contracts: Specifications & Surveillance (NAVFAC MO-327), Naval Facilities Engineering Command, November 1985.
- 5. Student Guide for Facilities Support Contracting, Naval School for Civil Engineer Corps Officers, November 1983.
- 6. Real Property Facilities Manual Facilities Maintenance Management (Marine Corps Order P11000.78), Headquarters, United States Marine Corps, June 1980.

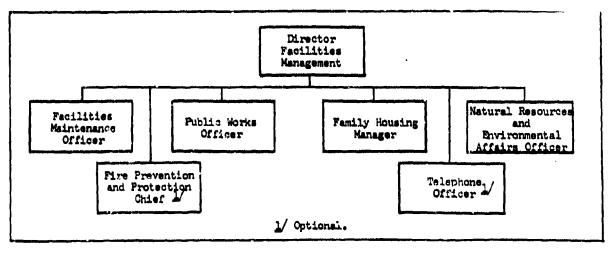
### **APPENDICES**

### APPENDIX A

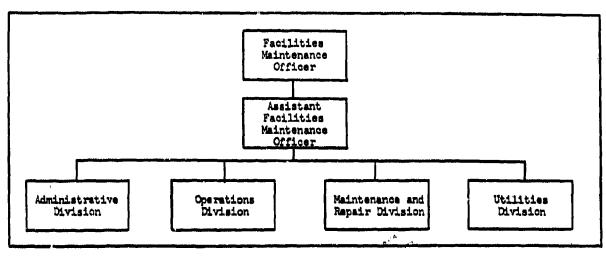
FACILITIES MAINTENANCE ORGANIZATION- MARINE CORPS

### APPENDIX A

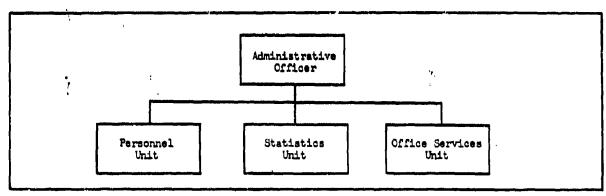
The extent to which Facilities Maintenance (referred to as Real Property Maintenance Activity, or RPMA, in the Marine Corps) influences the organizational composition, personnel requirements, and responsibilities of the facilities maintenance department. The criteria, therefore, for determining the suitability of an organizational structure are based on functions common to facilities maintenance departments at Major Marine Corps Activities. In addition, at Marine Air Stations, the maintenance department is under the cognizance of the Public Works Officer while at ground activities the maintenance function is under the Facilities Maintenance Officer. Figure A-1 reflects a typical Marine Corps Air Station (MCAS) Maintenance & Utilities Divisions.



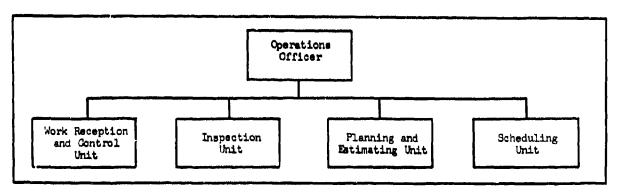
-- Typical Facilities Management Organization.



-- Facilities Maintenance Department.



- .. -- Administrative Division.



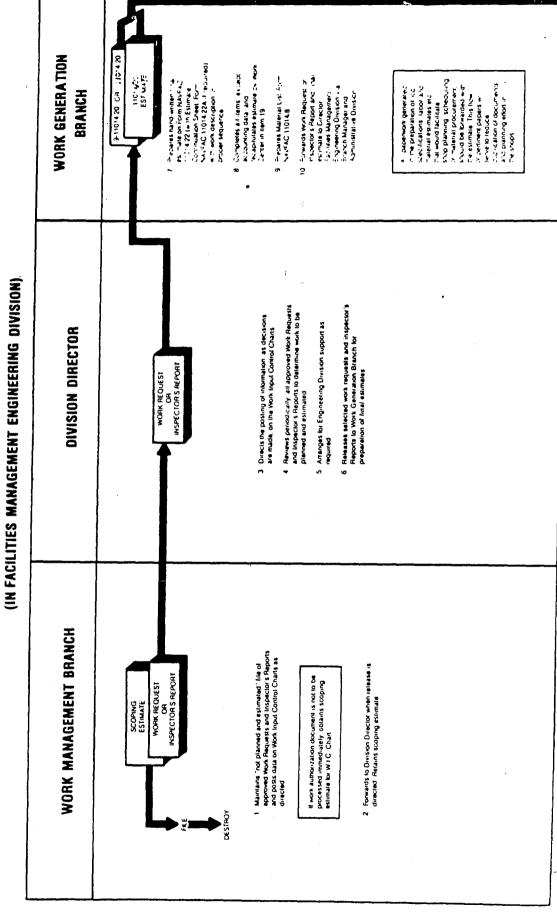
-- Operations Division.

### APPENDIX B

- B(1). MINOR WORK PROCEDURE
- B(2). SPECIFIC WORK PROCEDURE
- B(3). LEVEL OF MAINTENANCE CODES

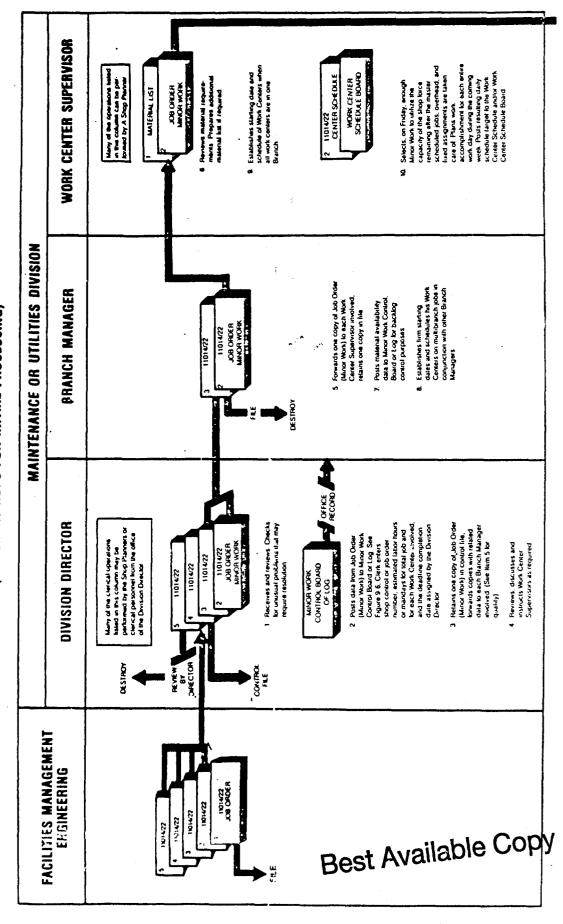
Appendix B(1)

# CHART NO. 5 INITIAL PROCESSING OF SPECIFIC JOB ORDERS AND MINOR WORK AUTHORIZATIONS

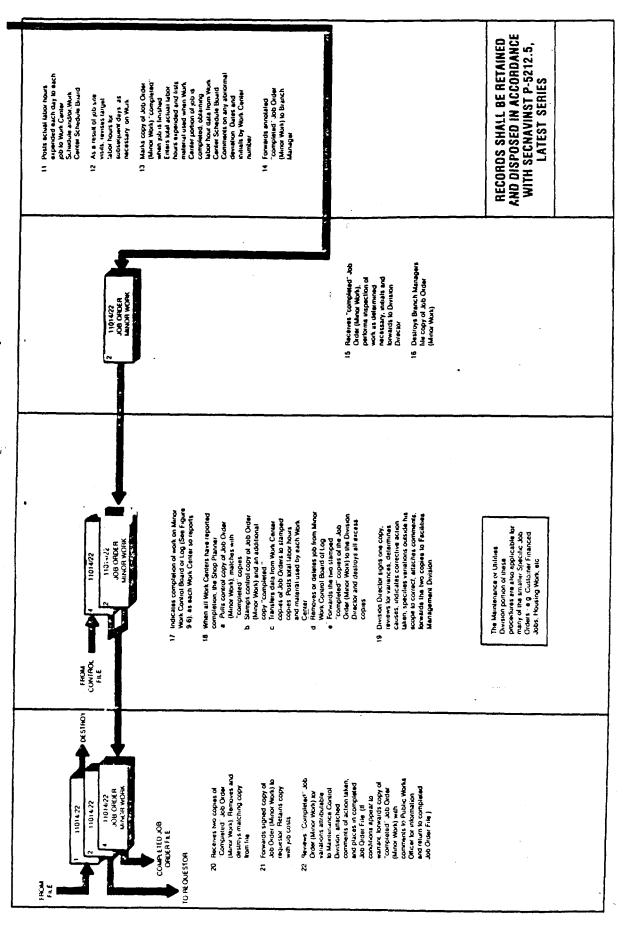


Best Available Copy

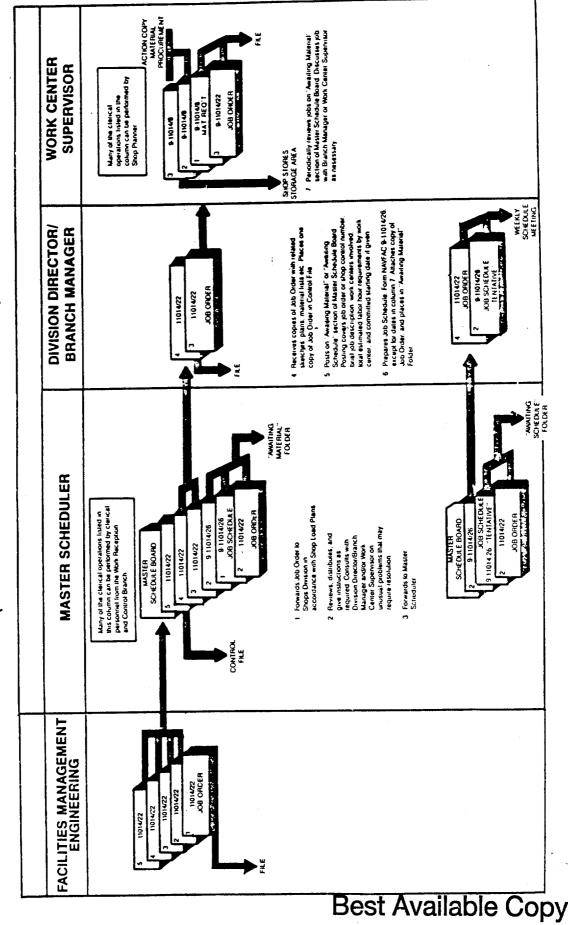
### SUBSEQUENT PROCESSING OF MINOR WORK AUTHORIZATIONS (SEE CHART NO. 5 FOR INITIAL PROCESSING) CHART NO. 6



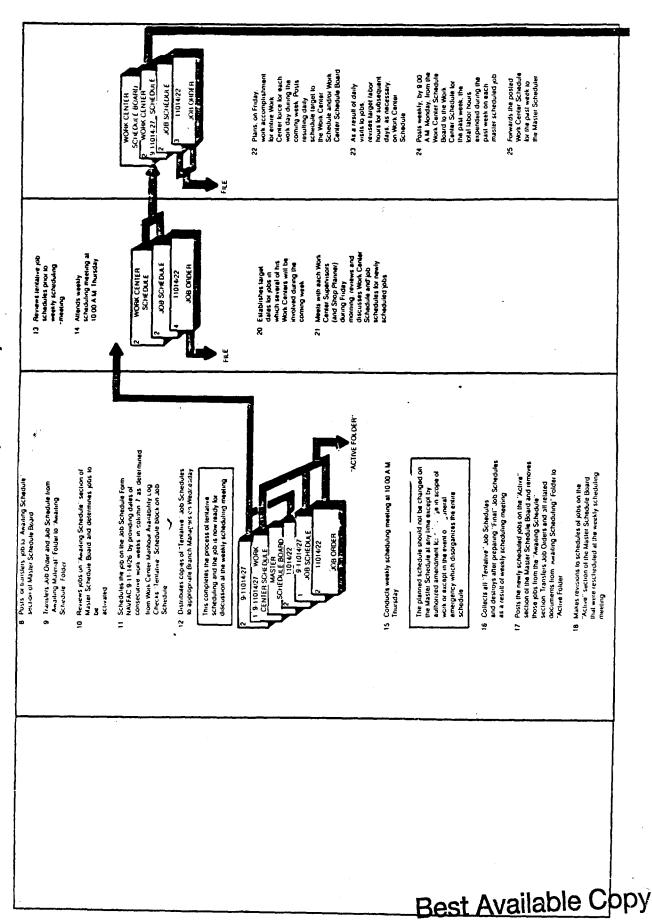
### CHART NO. 6 (Continued)



(SCHEDULING) SUBSEQUENT PROCESSING OF SPECIFIC JOB ORDERS (SEE CHART NO. 5 FOR INITIAL PROCESSING) CHART NO. 7



### CHART NO. 7 (Continued)

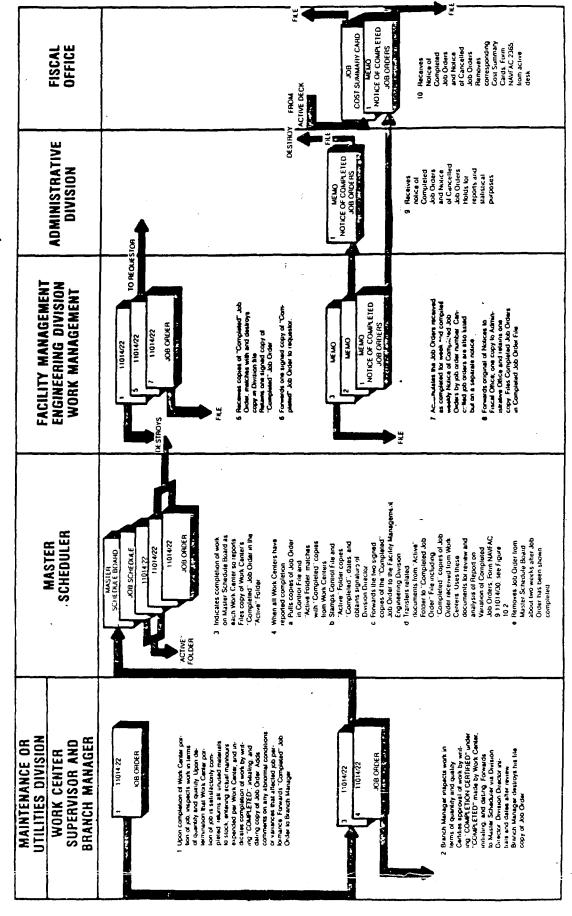


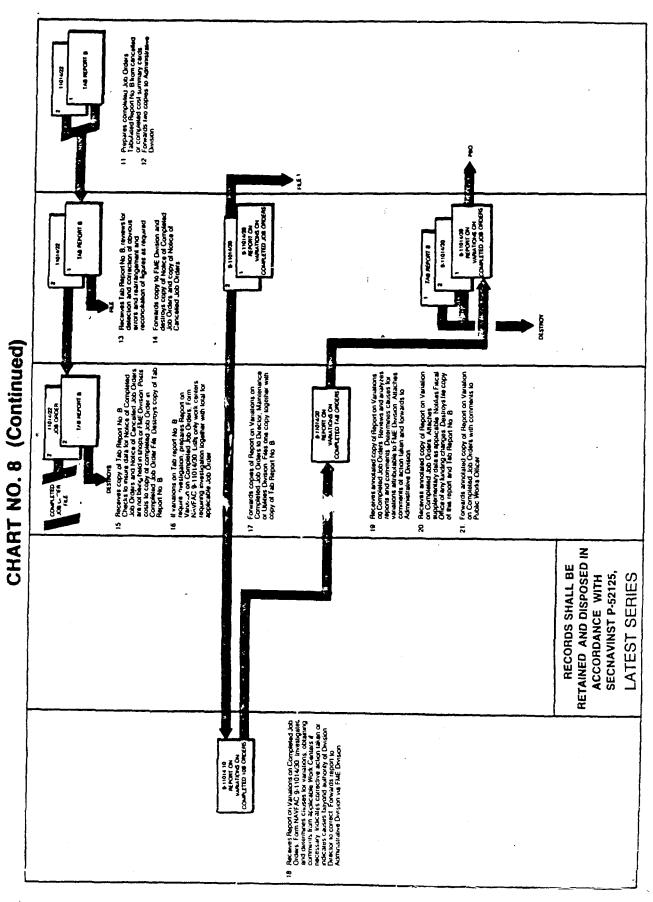
Appendix B (2)

## SUBSEQUENT PROCESSING OF COMPLETED SPECIFIC JOB ORDERS) CHART NO. 8

\* 14

(SEE CHARTS NO. 5 AND 7 FOR PROCESSING PRIOR TO COMPLETION)





Best Available Copy

Appendix B (3)

TABLE 7-1
Level of Maintenance Classification Codes
(LMC Codes)

ode	Classification Characteristics	Level of Maintenance
A	o Vital to activity mission o Active future of over 10 years o Excessive repair cost or downtime	o Maintain economically to assure full safe and efficient support for an indefinite period
3	o Important to activity mission o Active future use of 3-10 years o Excessive repair cost or downtime	o Maintain economically to fulfill facility mission for duration of facility life or mission
3	o Limited importance to activity mission	o Limited maintenance on basis of planned remaining useful life.
	o Substandard construction or future active life of less than 3 years	o Eliminate fire, health and safety hazards
	o Infrequently or only partially used	o Patch and reinforce instead of replacing wherever economical
	o No downtime effect and little effect upon activity mission	o Consider breakcown maintenance
,	o Inactive facilities required during mobilization)	o Limited maintenance to assure weather tightness, structural stability, protection from fire or erosion, elimination of safety or health hazards and to permit reactivation within the period prescribed under mobilization plans
0	Surplus facilities	o Fliminate fire, safety, and health hazards
		o Prevent pilferage or loss of items, effecting final disposal action

APPENDIX C

"BEST" COMPUTER SYSTEM

### APPENDIX C

### THE BASE ENGINEERING SUPPORT, TECHNICAL (BEST) MAINTENANCE CONTROL SUBSYSTEM

The BEST Maintenance Control Subsystem is a simple, flexible, interactive, automated management system to be operated and controlled by FME personnel. The system is comprised of standard user-friendly software and minicomputer equipment. It is designed to enhance the productivity of Navy public works maintenance personnel within the framework of the guidance provided in this manual.

Equipment for the Maintenance Control Subsystem will consist of a central processing unit (CPU), storage devices, visual display work stations, and printers. Size of CPU and storage devices, and number of work stations and printers will vary among activities.

NAVFACENGCOM will produce and maintain the standard BEST application software. Local additions to, or changes in, the standard software will be an activity responsibility.

Installation of BEST at shore activities will be performed under the direction of the Engineering Field Divisions. The first installations are planned for FY1985.

A brief description of the four modules comprising the maintenance control subsystem follows.

### EMERGENCY SERVICE (E/S) MODULE.

The E/S Module supports all efforts associated with managing an E/S operation. It provides rapid work request processing and data retrieval ability, performs statistical analysis on E/S work orders, facilitates the use of Engineered Performance Standards (EPS), and generates E/S management analysis reports on demand.

One can query the system at any time for job status, nature of requested work, date called in, or any other characteristic of an outstanding or completed E/S work request.

Management reports can be generated; indicating E/S backlog, job turnaround times, or standard vs. actual hours used; to analyze current E/S work performance. Work center/craft supervisors can focus on these reports to increase E/S workforce productivity and responsiveness. Additional management applications include selective analysis of work orders relating to such categories as, a specific housing unit or building, a type of equipment (e.g. air conditioners, pumps, etc.), or an individual craft or shop. The selected jobs can also be arranged and printed in any desired order.

### SHORE FACILITIES INSPECTION (SFI) MODULE.

The SFI Module performs all the normal clerical functions and operations associated with management of both the Control Inspection (CI) program for facilities and the Preventive Maintenance Inspection (PMI) program for installed dynamic equipment.

For both CI and PMI, a complete facility and equipment inventory, inspection frequencies, and labor standard hours are entered into the computer. This module produces schedules for both CIs and PMIs, with accompanying work orders specifying inspection requirements, frequencies, and inspection time standards. The schedules and requirements are based on the priorities and inspector availability which have previously been loaded into the computer. A listing, providing advance notice of scheduled inspections, can be produced for customers or other activity departments. Feedback from these listings may be a void basis for schedule revision. After the final schedule is approved, the system generates the inspection work orders. Upon completion, the actual labor hours expended on these work orders can be matched to the original schedule to produce performance reports and listings of omitted inspections.

The system can be queried at any time and management reports generated upon demand. This flexibility provides management an effective tool to ascertain the current condition of any facility or piece of equipment. Overall, this leads to better work scheduling, project selection, and maintenance.

### WORK INPUT CONTROL (WIC) MODULE.

The BEST system's WIC module performs all normal clerical operations are occased with monitoring work requests. It allows rapid data entry and releval, and generates management reports on demand. The module provides a means for the PWD to control the planned utilization of manpower resources as well as the definition, scheduling, and accomplishment of all work processed by the Facilities Management Engineering Division. This is done by providing Public Works Management with the ability to access the current status of work requests and job orders through each stage of their life.

The possibilities for control include:

- Screening individual jobs for necessity
- Determining the relative urgency (Priority)
- Programming work through the planning phase
- Authorizing the work
- Maintaining balanced workload for each resource pool
- Assuring proper completion of jobs

WIC tracks work requests and job orders from the time they are submitted until the work is completed by means of its four submodules.

- 1 Work Identification and Status
- 2 Shopload Planning
- 3 Operating Plan
- 4 Contract Status

The purpose of the Work Identification and Status submodule is to develop and maintain a workload identification system, to provide planning and status data on work from its reception to completion, and to control planning of work to facilitate shoploading and scheduling. After work is completed, the files are transferred from an "active" file to a "history" file and kept for comparative analyses.

The Shopload Planning submodule provides a plan for scheduling work to the PW Shops and relates the PWD backlog to manpower available for accomplishment.

The Operating Plan submodule records funding commitments, obligations, and expenditures. This permits management to forecast resource distribution over the available manpower and projected workload. The integration of work load and resources allows continuous evaluation and prioritization of the backlog.

The Contract Status submodule is a file which tracks work orders programmed for contract performance. This status information is used by the FME Division to detect potential scheduling conflicts with the in-house work force.

### FACILITIES ENGINEERING JOB ESTIMATING (FEJE) MODULE

The FEJE Module is a computerized version of the Engineered Performance Standards (EPS) Handbooks, NAVFAC P-700 series, which provide for both scoping and detailed estimates. It is designed primarily to estimate jobs that are to be accomplished by in-house personnel, but can also serve as a baseline for work accomplished under contracts.

FEJE uses Work Codes and standards contained in the Unit Price Standards (UPS) Handbook, NAVFAC P-716.0, to generate scoping estimates. The UPS include per unit labor requirements by craft, material requirements by type, and special equipment by description to provide a per unit dollar estimate which is extended by the number of units in the job to develop the overall estimate. The unit data is tailored by applying local prices for labor, material, and equipment. Activities can also enter historical data to provide a basis for additional non-UPS scoping estimates. The Planner and Estimator can modify the line item extensions, if appropriate, to more properly reflect a specific job's content. Hardcopy estimates, including the job description, unit and extended quantities and associated costs, are generated for each Work Code.

FEJE utilizes the EPS standards and procedures to generate detailed estimates. Each job is structured into job phases and tasks within each phase. FEJE guides the Planner and Estimator to the most appropriate task time standard through a series of tutorial screen displays and through the use of a Key Word Index. Slotting is accommodated and task time standards are recorded for specific tasks within a phase. Non-EPS based tasks are entered by the user while developing the job estimate and nomograph factors are automatically calculated. Thus, a Job Phase Calculation Sheet including job identification and description is developed after each phase. Upon completion of all job phases, the FEJE Module produces a hardcopy Job Phase Calculation

Sheet for each phase, work authorization/estimate continuation sheet, and a work authorization/estimate summary sheet for each job. The work authorization/estimate sheet includes a line entry of craft costs, based on local wage rates, for each phase. The estimate sheet also displays the total number of EPS and non-EPS hours estimated. FEJE also permits establishment of local Task Time Standards. Interfaces with work input control, scheduling, and memorandum accounting systems are possible.

APPENDIX D

LABOR CLASS CODES

LABOR CLASS CODES	DESCRIPTION
01	Service Work - All productive non-emergency work performed under emergency/service work authorization, which is 16 manhours or less.
02	Emergency Work - All labor required to correct or repair a condition caused by a breakdown or an emergency including all labor subsequently authorized on a Minor Work Authorization or Specific Job Orders as well as that portion authorized by an Emergency/Service Work Authorization.
03	Preventive Maintenance Inspection (PMI) - All labor expended by semi-skilled and skilled tradesmen while performing preventive maintenance inspection and service.
04	Standing job Orders - Not Estimated - All productive labor that is authorized on a standing job order which has not been estimated.
05	Standing Job Orders - Estimated - All productive labor that is authorized on a standing job order which has been planned, estimated, and scheduled.
06	Minor Work Authorization - All productive labor authorized on a minor work authorization.
07	Specific Job Orders - All productive labor authorized on a specific job order.
40	Rework - All labor used in the correction of faulty work on the part of the Public Works Department, regardless of the code previously applied.
41	Supervision - All supervisory personnel, and that part of a leader's time spent on supervision.
42	Shops Indirect · Semi-skilled and skilled craftsmen no: directly chargeable to productive work which includes the schedulers and shop planners; also, labor spent in maintenance and repair of shop equipment und power tools; also, time expended by non-graded Public Works personnel on material handling when such labor is not chargeable directly to a job. Labor expended by shops personnel in cleaning up their work area, excluding work of the regular janitorial force.
43	Allowed Time - All non-productive time expended on official business; waiting for material, tools, parts, equipment, transportation, etc.; administrative leave, excused tardiness and time loss because of inclement weather; time spent awaiting work assignment.
44	General Office and Clerical - Graded personnel who are on the roster of the Maintenance or Utilities Divisions but not those graded personnel assigned to the Maintenance or Utilities Divisions who are on the roster of the Administrative Division.
45	Leave - All approved absences for sick, annual, and military leave, holiday pay, terminal leave, jury duty and all other leave for which pay is received.

FIGURE 6-15
SUMMARY OF MAINTENANCE AND UTILITIES DIVISIONS LABOR CLASS CODES

### APPENDIX E

- E(1). WORK AUTHORIZATION / ESTIMATE
- E(2). CPM APPLICATION
- E(3) JOB ORDER PHASE CALCULATION SHEETS
- E(4). JOB ORDER PREPARATION INSTRUCTIONS

Appendix E(1)

				-											T
iii						į	A STATE OF THE		į×	¥18-8					M17456 50-001-B4
1 3		U.S. MINK. STATION	١.			Ë	100		-	-		4.	!1	**********	
ž		1				۳	12		!			-	3	CONSTRUCT A PARTITION 30" LONG, 12" MICH, 2"%" STURS, 10" O-C,	H, 2"14" STUBS, 16" 0-C,
23			35						-			1		1/2"54" #4" GPP. BOAID, BASEBOARD, SHOE JAD CETLING CONEONE SIDE	JOSE CELLING CONE-CORE STAE
	,	1				H		-	1	1				CHEY (LEAVE STURS OPEN ON THEIRE OF HEN OFFICE SPACE FOR OTHER	OFFICE SPACE FOR OTHER
17.	17,4912,1983			mm	# 50	~		25100			,			CHAFT WHICH	
Ę	JIN JONES 6PICE	3 5		,	75 T.	27.27 E	1	<b>:</b>		B	ļ.				
PARLAL	, y	BUILDING NO. 14 CONNETT EAST END	MACET	EAST GR	FOR OFFICE USE.	188	}	<u> </u>				~	E	INSTALL 11/2" WATE LINE TO MATER COOLER, COMMECT TO EXISTING WASTE	ER, COMECT TO EXISTING WAST
	THETAL MEN P.	THETALL MEN PARTITION . TOTTING.		TOTAL SECTION				PT FT	8		<u> </u>			LINE IN COMM. SPACE. INSTALL 11/2" WENT AND CONNECT TO EXISTING	NT AND CONNECT TO EXISTING
3	318	CAST STAK OF WARRINGS BUSINESS FT.	8	ALL PARTY	12. % Idea	06:10	200	2		2. DOS OFTICE SPACE FOR SUPPLY SPACETIES.T.				WENT STACK DR ATTIC. THSTALL 1/2" CHL.	INSTALL 1/2" CALD MATER SUPPLY LINE TO COOLER,
												-		CONNECT TO SUPPLY LINE IN COME, SPACE.	BISTALL WAYE AT COOLER END
										1				NSE COPPER TUBUNG.	
					×	1						_			
	<b> </b>			1											
q.	Ħ.		•			4.	ij.	ij.	ļ	1.	4.	m	2	MEHOME (8) EXISTING INCAMPRICATE LIGHT FIXTURES AND 140° WINE AND	FIXTURES AND TAD" WINE AND
_		SEE CO-TRAMTION SMEET	MATTE	N SHEET			3	_	37	28	3102			COMMET. INSTALL MEN 4D) CINCUIT PASTRIBUTION PANEL, COMPUT,	IMMIGH PARE, CHEWIT,
							E	k	2	3	# F			OUTLET BORES FOR PLUMESCENT LIGHTS AND RECEPTALES, AND PILL VINES.	HECEPTACLES, AND PULL WINE
	-		ļ				ğ	ķ	3	ğ	2060				
	T						ME	<u>+</u>	ā	124	28	4	£	THETALL 2" STEAM SUPPLY AND 314" COMMENSATE LINES TO MANIATORS AND	SATE LINES TO BANTATORS AND
	$\vdash$						Ē	3	8	見	8			CAP BAF ABOVE FLACE. (CAMPECT TATO EX	COMMECT THTO EXISTING LINES IN COMA, SPACE)
								-						(STERL FIPE). IMPRATE 2" STEAM SUPPLY LINE AND FITTINGS (FIBER-	I LINE AND FITTINGS (FIDER-
†	+							-				1		GLASS INDIRATION).	
	$\vdash$							$\vdash$				-			
	-							-				*	3	THEFALL 1/2"4" 4" GP. BRAID, BASBIRAIN, AID CEILING COVE ON NEW	M, AND CERLING COVE ON NEW
	-													PARTYTION INCIDE. INCIDE CIAIR MAIL OF	INSIDE CHAIR MAIL ON ALL INTERIOR MALLS. IN-
1			1				1	263¢ 2630	83	***	324			STALL PREMAIS BOOK AND JAME COD HET IN	AND JAMB COD HAT INSTALL SHOE HOLD AT THIS TIMED
9	~	SOMED	~				1	t.							
1	Ŀ				_		į	-				•	E	INSTALL (ND PLEOMESCENT LIGHT FIXTUMES, GD RECEPTACLES AND	S, (4) RECEPTACLES AND
	•							1						COMMECT WINES.	
160	E					9				4-2-4	7				

Å

\*

Work Authorization/Estimate FIGURE 5-2

Ŕ

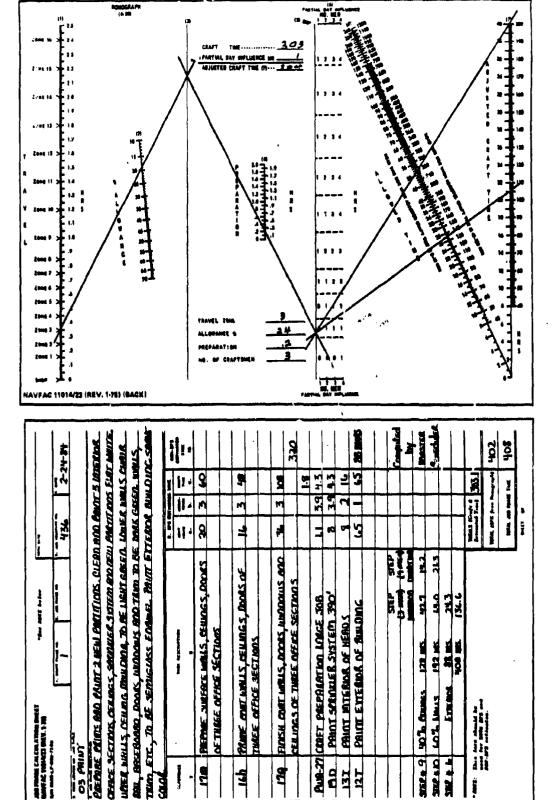
į

### Appendix E(2)

### Appendix A

### PROCEDURE

- 1. DIAGRAM DEVELOPMENT. The job order is received by the Master Scheduler through the normal job order procedure, except that Job Phase Calculation Sheets (Figure A-1) are included on those multicraft jobs estimated to cost \$5,000 or more. The Master Scheduler may request the Job Phase Calculation Sheets on smaller size jobs when critical path scheduling is desirable.
- a. Job Description. A sample job (Figure A-2) demonstrates the techniques and advantages of Critical Path Scheduling. This particular job typifies complexities that confront Master Schedulers on large multicraft jobs. This job was estimated to cost approximately \$5,000, involved six work centers, and required outside purchase as well as Navy stock materials.
- b. Step List. A step is a specified unit of work that can be accomplished without interference or interruption from any other work. The Master Scheduler develops a Step List (Figure A-3) of normal operations from each phase on the Job Phase Calculation Sheets, Figure A-1. The number of steps, or self-contained units of work, that is in each phase will be determined by the Master Scheduler by examining each task description. Figure A-1 shows that in some instances a single task is a step, and in other instances a step may consist of a number of tasks, or a step may be subdivided. For example, Figure A-1 shows interior painting in five items: The Step List regroups these into two steps: 9, paint ceiling, and 10, paint walls. As discussed in paragraph 4d, these steps might be regrouped as: 9, prepare ceilings and walls; 9a, prime ceilings and walls; 9b, paint ceilings and sprinkler system; 9c, paint upper walls; and 10, paint dado. The degree to which steps are combined, or subdivided, will depend upon the work directly involved, the type and amount of related work involved, and the degree of coordination required. After preparing the Step List, the Master Scheduler should prorate to each step that percentage of the "total job phase time hours" on the Job Phase Calculation Sheet that is contained in each step. This will allocate the proper share of the craft preparation, allowances, and travel time that is applicable to each step. Generally, prorating a phase won't cause a problem; however, allow sufficient time in each step for the applicable allowances. If desired, assistance can be obtained from the Planners and Estimators in prorating these allowances to the steps. The amount of total allocated hours for a step is divided by the number of personnel in the crew assigned to that step. The quotient is the duration time (clock time, calendar time, or crew time) for each step (Figure A-3). There may be other steps not shown on the Job Phase Calculation Sheets that should be considered, such as: direct procurement maturial lead time and stock item material lead time. These are separate steps.
- c. Arrow Diagram. An arrow diagram (Figure A-4) shows graphically the interrelationships and interdependencies of the various steps in a total job plan. Each step in the job is represented by an arrow. The arrow diagram is simple in detail, but it does require some trial and error before the proper relationships of the steps are established. The arrow diagram should be constructed in accordance with the following criteria:



Job Phase Calculation Sheet FIGURE A-1

g

District and Them (2) where the control them became and th	and the last of th		) shortest
		Ci ca cana	Colore
į		66929	353
1974 I	1 1 1		
2515 1721404	12006		
		The same of the sa	* Chira 6866
	7		To be the second
CONVENT STONEHOUSE, BUILDING 32 INTO THREE OFFICE AREAS	INTO THREE OFFI	TE AMEAS	

Convert starchaese, Building IX into three office areas (40'138') by installing two partitions, each with center door, install man lighting with cutchts, assisten the concented wither. Paint affice buffer including doors, such and tria, two costs. Lay asphit tile over present wood floor. Paint building atterior.

+ Official of white				, and	or de desimable	
-	티	4	11.	ţ	1.	ų.
Construct and erect 40 linear feet		3	900	279	į	1,138
of 12° high full partition sheat-		12	ತ	3	£	1,18
and with sh	-	Ē	8	3	2	•
olding to be		ķ	छ	8	Ę	. 20Z
"x2" (" doer (flush t)		Ŧ	-	13	~	2
rail to be installed on well.	_	157	23	161	22	Ř
	-					
		_				:
	_					
22 Begrimpeliebe		1	878	2050	3169	8,210
	,	. (100)	â			
	•	1	1	-		
	·		1			5,129
***************************************	4774				-	A min A

101 Lay 5000 St. FT. ad \$"" anabalt ties with 150 japualt felt base on california and paint sites and took ties application.  Continued and routh saded before completion of tile application.  Dressing prime and paint all partitions surfaces. Clean, prime and paint states and paint surfaces in office sections. Point california activate place, california modeling, door, exting, and bases board flet witt. Halls above door, californ modeling, flowers. Friend all walts facultain and fact and states and the states and tile above door, californ modeling, flowers. Friend all walts factured the states and tile above door, californ modeling, flowers. Friend and connect a states and tile above door.  Interest and connect flow sectional type can from replaining. From tile flowers and lights, bases capped, circuits disconnected and abundant in place.  Interest and connect three water cookers. Provide trape on new waste times and valves on new waste times and valves on new supply lines.  Remove and property dispose of debris and extra material discarded in, around and under the building as a result of this work.	e with 150 asphalt felt base se floor structure to be menting 150 felt. Baseboard	•
CO Lay 5300 se cultified and selection selecti	e with 150 report fett hase see floor structure to be enting 150 fett. Bashoard	ł
resisting free existing shoe moutal shoe moutal to paint all selling site of the selling frame all selling frame selling server selling frame selling server selling serve	se ther structure to be enting 150 felt. Baseboard	
shon mould show and show and show a s	working 150 felt. Baseboard	
Property pates all pates all a catified all a catified all a cate		2,5
Property passes all passes all passes all passes all a board that board that all a doors, wing faster tight general and bearest tight and bearest and	1 4:1	ij
paint all actifing, a board of a little and	ms surfaces. Clean, prime and	
Paint ail a doors, wind false exect false exect form tight form tight family and formall and sauste times	Paint	
Paint ail a doors, wind Falot cert tight cent tight among a il Install and Vide trags, vide trags, vide trags, vide trags,	ng moreonis, enor, casing, and bates Goot, seiling moulding, limbs areas.	
Paint exter Paint exter Court tight court tight memory and in pice.  Journal and vide trags.		
Faint exter  Install and cont tight Benove ald in place.  Install and vide trags.  Install and maste times  in, around	to be seel-glass. Paint	
Install and cont tight hamore ald in place.  Journal and vide trags.  Install and waste lines and in, around		3
Gent tight in the property of the price of t		<u> </u>
Employe ald property of the prince and vide traps.  Install and waste times and in, around in, around in a second	and 12 deplet convenience flush mounts, outlets.	
Install and connect vide traps. Install and connect seaste lines and value in, around and under	fights, bours capped, circuits disconnected and abandance	
Install and connect vide traps. Install and connect sessie times and value in, around and under		<b>A</b>
install and connect Anstall and connect sostie times and value in, around and under	1	
Lattail and connect sessite lines and value was and property in, around and under	Tran sectional type cast tree registers. Pro-	
Install and connect naste lines and value and property in, around and under		=
Antrall and connect session to the session of the s		
Maste Lines and value of the second s	Ch. Provide track on par-	Ĺ
Unagene and property.		*
Service and property.		•
in, around and underly		
in, around sed under	and outer material electrodes	
	Fult of this wor	-
		$\perp$
		_
		_
		_

FIGURE A-2 Work Authorization/Estimate

STEP	WORK CENTER	TOTAL HOURS	NO. IN CREW	NORMAL DURATION TIME (HOURS)	STEP DESCRIPTION
1	•	120	•	120	Fixtures, outside procurement time
2	•	56	**	56	Fixtures, outside procurement time  Navy stock, lead-time
3	01	80	2	40	Build partitions
4	21	114	2	57	New panel, E.M.T., Wiring
5	15	63	2	31.5	Steam pipes (access area)
6	02	<b>*</b> 87	3	29	Paint exterior building
7	11	24	1	24	Water pipes (access area)
8	01	228	2	114	Sand floor and lay tile
. 9	02	*128	3	42.7	Paint ceilings
10	02	*191	3	63.5	Paint walls
11	21	39	2	19.5	Install light fixtures
12	15	11	2	5.5	Install radiators
13	11	5	1	5	Install water coolers
14	32	8	1	8	Clean up

<sup>\*</sup>This item is the proportion of the "job phase allowed time" that is prorated to this particular step reflected in the Job Phase Calculation Sheet.

FIGURE A-3 Initial Step List

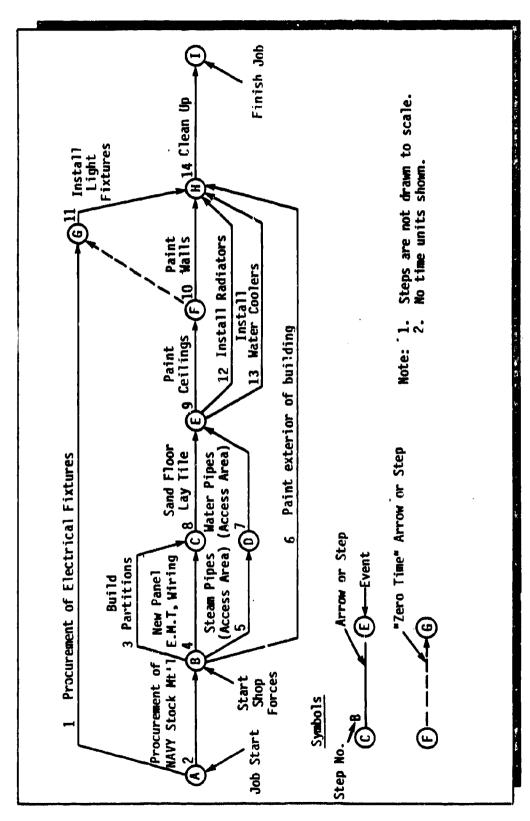


FIGURE 4-4 Arrow Diagram

- (1) Arrows generally should point to the right so that the job begins at the left and ends at the right.
- (2) Each arrow (step) is joined by circles that are usually lettered to identify an event, such as the completion of a step or steps, or the beginning of a step or steps.
- (3) Arrows (steps) are numbered to agree with the step number shown in the step list. A brief description of the work involved may also be placed on the arrow.
- (4) Arrows are joined in their logical sequence of work and the work represented by one arrow must be completed before the work represented by the next arrow can start; for example, in Figure A-4, arrow number 4 cannot start until arrow number 2 has been completed.
- (5) Arrows with solid stems represent work that is to be accomplished, or measurable delay periods such as the time required for procurement of material. Arrows with dotted stems show the interrelationship of planned events and, as such, are not steps. For example, in Figure A-4 the dotted line arrow between events F and G means that step 11 should not start until step 9 has been completed.
- (6) The numbers of the steps and the letters for the circles will not necessarily be in sequence from left to right on the complete arrow diagram. However, the arrows (steps) are placed in their logical sequence of work and arranged so that the interrelationships can be seen. In Figure A-4 steps 2, 4, 8, 9, 10 and 14 are one chain of steps, and steps 2, 5, 7, 12, and 14 are another chain of steps. Step 4 can be started as soon as step 2 has been completed, but step 8 cannot be started until steps 3 and 4 both have been completed. Step 11 could be started as soon as step 1 has been completed, but the job is such that step 11 cannot be started until step 9 has been completed. This latter situation is shown on the diagram by a dotted arrow of zero time value from the circle indicating the completion of step 9, event F, to the circle representing the start of step 11, event G.
- 2. DETERMINATION OF CRITICAL PATH. When the Master Scheduler is satisfied that the interrelationship of the job steps on the arrow diagram are truly represented, the duration time of each step is entered on the diagram. The "critical path" will be the chain of arrows (steps that result in the longest duration time for the job, because the total job cannot possibly be completed any earlier than the chain of steps with the longest duration time. The critical path is shown by a double line of arrows. Only by decreasing the duration time of one or more of those arrows (steps) on the critical path can the total job duration time be decreased. Indicating the duration times on the steps of the Arrow Diagram and determining the critical path completes its transition to a Critical Path Diagram. See Figure A-5 for the initial critical path for the job described in Figure A-2. Depending upon the time required for material procurement, there may be two critical paths, one for the total job including material procurement, and one for shop forces (or shop schedule) that covers only the shop labor required. In Figure A-5 the critical path for the total job includes steps 2, 4, 8, 9, 10. and 14 while the shop schedule includes steps 4, 8, 9, 10, and 14. Note that if step 1 took 360 hours to accomplish, then the critical path for the total job would be steps 1, 11, and 14.

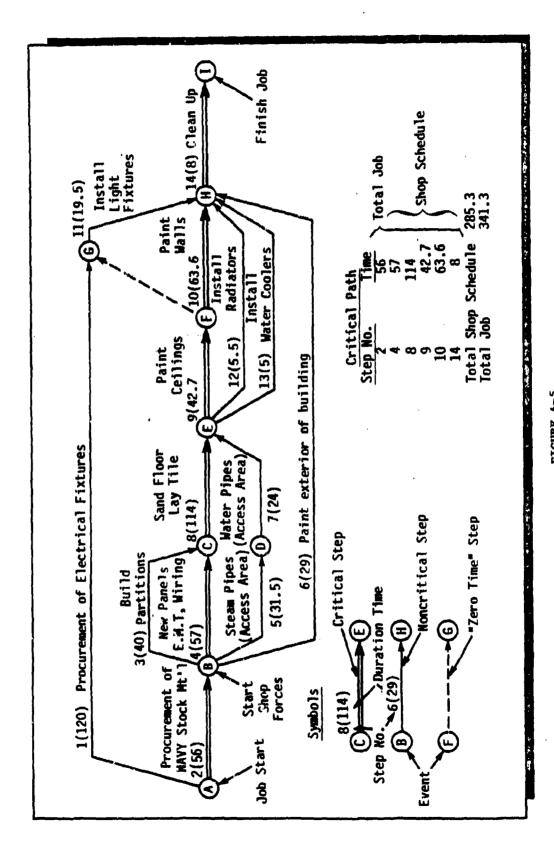
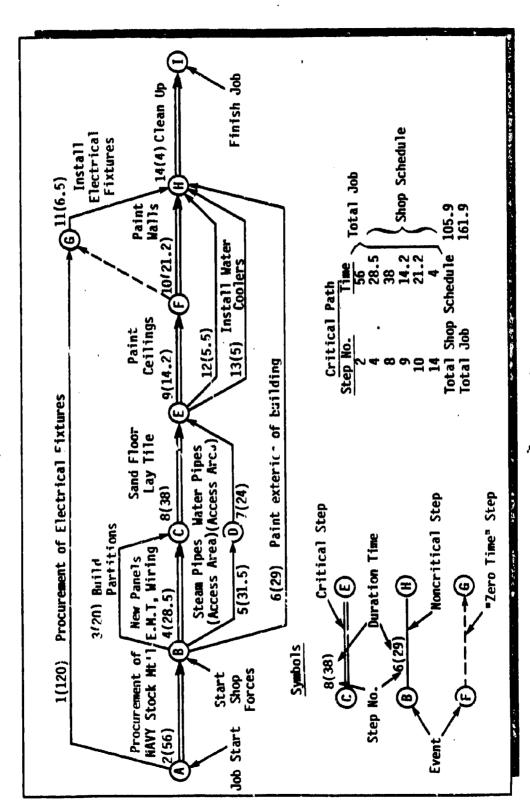


FIGURE A-5 Initial Critical Path

- 3. FLOAT. "Float" is the amount of slack time within which the starting point of an arrow that is not on the critical path can be moved without disturbing the critical path. Arrows (steps) with zero float (no slack time) are always on the critical path. The recognition of float allows the Master Scheduler to (a) analyze the effect on noncritical steps when the duration time of the critical path is reduced, and (b) either reduce the crew size (spread the work) to utilize the available float to balance the work force or vary the ultimate schedule starting date of the step within the float limitations. An example of float is seen when step 7 in Figure A-7 is scheduled. Since steps 5 and 7 are to be started and completed while steps 4 and 8 are being accomplished (see Figure A-6), an 11 hour float exists for steps 5 and 7. Because it was considered desirable to start work on step 5 at the beginning of the first week, along with steps 3, 4, and 6, step 7 can be started anytime after 4 P.M. (assuming an 8 to 4:30 workday with 30 minutes for lunch) on 4 May provided that the work is completed by 10:30 A.M. on 11 May. Because it would be uneconomical to have the craftsman start step 7 with only 30 minutes of working time left in the day, a later start is made. Also, because enough float exists for this work, step 7 is scheduled to start at 8:00 A.M. on 8 May, the beginning of the second week.
- 4. DECREASING JOB DURATION TIME. The initial critical path has been developed through analysis of normal operating procedures and working hours. Improving the critical path is the most important part of scheduling. The improvement amount will depend upon the management objective for scheduling this work, material procurement factors, available personnel, and the makeup of the job itself.
- a. Management Objectives. Normally, management schedules jobs to obtain minimum effort and expense. However, management may dictate other objectives such as:
  - (1) A directed completion date
  - (2) A directed starting date
- (3) A minimum or shortest time plan involving overtime or other crash methods
  - (4) Use of maximum numbers of personnel, with or without overtime
- (5) Directed starting or completion dates for specific portions of the job.
- b. <u>Guidance and Assistance</u>. The Master Scheduler should seek advice and assistance from appropriate supervisors regarding improved work methods, better job sequencing, the possibility of overtime use, additional personnel or shifts, special equipment, or more advantageous material.
- c. Trial and Error. Any decrease in time of any arrow (step) on the critical path will decrease the total duration time for the job. As with the arrow diagram, a trial and error method is required before the final plan is developed. The initial critical path for shop forces consists of steps 4, 8, 9, 10, and 14. One way to shorten the time would be to increase the number of craftsmen on each step. Doubling the crew on steps 4 and 14 and tripling the crew on steps 8, 9, and 10 would reduce the time from 285.3 hours to 105.9 hours. This increase in crew size appears reasonable because of work space



\*FIGURE A-6 Final Critical Path

and labor hour availability. However, step 3 now becomes critical rather than step 4; but by doubling the step 3 crew, step 4 would again become critical. Because step 11 cannot start until step 9 is completed, the initial time for step 11, 19.5 hours, is not critical compared to step 10 (when triple crewed) at 21.2 hours. However, because of the nature of operations such as light fixture installations and wall painting, some interference among personnel might occur. By tripling the crew on step 11 this difficulty would be avoided.

- d. Variations. A more detailed study of steps 9, 10, 12, and 13 shows another possible variation. As shown in Figure A-6, radiators and water coolers (steps 12 and 13) are to be installed while ceiling and walls are being painted (steps 9 and 10). Questions involved here are:
  - (1) Are radiators to be painted?
- (2) How can walls near radiators and water coolers be painted at the same time plumbers and pipefitters are working?
- (3) Is it desirable to paint walls near water coolers and radiators prior to, or at the same time as, the ceilings?

As suggested in paragraph 1b, steps 9 and 10 might be subdivided and regrouped into: 9, prepare ceilings and walls; 9a, prime ceilings and walls; 9b, paint ceiling and sprinkler system; 9c, paint upper walls, and 10, paint dado. This arrangement would minimize spotting wall because different paint colors would be used. Also step 10 could be subdivided into two steps; 10a, paint dado behind radiators and water coolers; and 10b, paint balance of dado. This latter arrangement would, however, change the critical path and increase the total shop duration time. Another variation, which would not change the critical path or the shop duration time, would be to subdivide step 9c so that steps 9c and 10 would read: 9c, paint upper wall in area of radiators and water coolers; 9d, paint dado in area of radiators and water coolers; 9d, paint dado in area of radiators and water coolers; 9e, paint balance of upper wall; and 10, paint balance of dado. Electric fixtures, idiators, and water coolers would then be installed upon completion of step 9d.

- e. Final Critical Path. Figure A-6 assumes that all improvements in the critical path have been made with minimum effort and expense.
- f. Final Step List. When the Master Scheduler is satisfied that the best critical path has been developed, a Final Step List is prepared (see Figure A-8) with the final crew assignments, revised duration time for each step, and any applicable information for scheduling.
- g. Treparation of Schedule. The transition from the Final Step List, Figure A-8 and final critical path, Figure A-6 to the Job Schedule, Figure A-9, is made by means of a Job Schedule Bar Chart, Figure A-7.
- (1) Job Schedule Bar Chart. The chart is divided into weeks of five workdays. (If overtime is used in the critical path, the chart should be arranged to show the overtime effort). Steps may be listed in sequence of step numbers and each bar (step) measured in duration time (in hours) for each step as taken from the Final Step List, Figure A-8. Critical path steps should be plotted first and in critical path sequence. From the Final Critical Path, Figure A-6, step 4 would be plotted first because the job is

		1		l	•	4	:	5	3	16 17	7.0	2								
	-	7 75	+ ¥	*	-7(	Second Week	Fee.	<u>.</u>		Third Mek	ZE.		3	<b>Q</b> .5	Mark	First Park		Sira fotal	2 2	
3.5		7 - T	S -	\$	ر س		<b>3</b> ~	ŧ_	<u>-</u>	<b>)</b> -		\$	), 	ż	e e		Ş	1	Approx	
346401	$  \uparrow  $	$\dashv$		$\dagger$	H	dash	ightarrow		2	4			•						97	
2		-		†-	<del> -</del>		_			-			7						\$	
77	11	2		<u> </u>	十	+	<u> </u>		<del>                                     </del>	<del> </del>	<u> </u>		•	•	ŏ	<u> </u>			8	Scizeland labor-hoom Buretion hours
+		5	9	<del>                                     </del>						-			4	•	17	# S.			*	Schooled lebs homes Doretion haves
2		516							•	_			5	7	4	5.K			3	Schadoled Index-hours Obcration haves
9	1	5	1										•	3	20	67 78			. 78	Schabibilaborbary Dorotion hones
~		-			╫	=			<del>                                     </del>				1	-	=		**		*	Schadolet Laborhaus Denstion hours
60		<del> </del>	್ರಾ	14.5	1	2	8						₩	•	10	2 Z.	159 16.5		228	Schooling labor hours Duretion hours
6							72	7	706	<b>_</b>			•	•	70		12.5	3 7:	8111	Schedolet Leberhoon Overfron hous
6						-		79		2	පත		9	•	25			70.8 11.3	8	Schebundlager April Scheristers
	-										ا ت		11	9	n			39 6.5	39	Scheddedlater spers Durgtion hoors
77	$\dashv$	H	口						31				U	7 -	9			= 23	=	schedolediabarra Deretion hours
51	42	Set	4		-	-			51				67	•	"			~~	34	Sciedalidion topos Ourotion topos
±	<b>;</b> }-	-		片	_	_	<u></u>	·	-	Ø	ල ්		#1	7	25			<b>*</b>		Solabied light hours Dutation hours

FIGURE A-7 Job Schedule Bar Chart

STEP	WORK CEN- TER	TOTAL HOURS	NO. IN CREW	NORMAL DURA- TION TIME (HOURS)	REV NO. IN CREW	REVISED DURA- TION TIME (HOURS)	STEP DESCRIPTION
1	1	120	•	120	•	120	Fixtures, outside procurement time
2	88	56	•	56	1	56	Navy stock, lead-time
3	01	80	2	40	4	20	Build partitions
4	21	114	2	57	4	28.5	New panel, E.M.T., Wiring
5	15	63	2	31.5	2	31.5	Steam pipes (access area)
6	02	87	3	29	3	29	Paint exterior building
7	11	24	1	24	1	24	Water pipes (access area)
8	01	228	2.	114	6	38	Sand floor and lay tile
9	03	129	3	42.7	9	14.2	Paint ceilings
10	02	191	3	63.6	9	21.2	Paint walls
11	21	39	2	19.5	6	6.5	Install light fixtures
12	15	11	2	5.5	2	5.5	Install radiators
13	11	4.5	1	5	1	5	Install water coolers
14	32	8	1	8	2	4	Clean up

FIGURE A-8 Final Step List

committed to start on 1 May. Step 8 would be plotted second, followed by steps 9, 10, 14, 11, 1 and 2. In this example, steps 11, 1, and 2 are plotted right to left, because the right-hand time has been determined from the critical steps. Note that the start of steps 1 and 2 will be earlier than 1 May and that step 1, procurement of Navy stock material, should be by 25 April; and step 2, procurement of Navy stock material, should be initiated by 20 April. The appropriate duration time and the labor hours required for each step for each week should be shown in the Scheduled Hours Table on the Job Schedule Bar Chart. In like manner, the noncritical steps are placed on the chart; however, "float" will allow some freedom of choice in scheduling these steps in accordance with shop practice. The starting and finishing dates for each step may then be read from the completed chart.

- (2) Job Schedule. A job schedule (see Figure A-9) is prepared from the Job Schedule Bar Chart. The Job Schedule should be prepared on a realistic basis. For example, the Job Schedule Bar Chart indicates that step 11, install light fixtures, has a duration time of 6.5 hours (39 manhours) during the third week. More specifically, it shows that this step would require 3.6 hours for each of the 6 member crew. As step 11 can be completed in a duration time of 6.5 hours, it is more economical to schedule this step to start on 17 May instead of 16 May. Transportation for the six-member crew would be required twice rather than four times, and the painters would be further along with their work, causing less potential interference. Similarly, step 14, clean up, could be scheduled for 18 May instead of a part of 17 and 18 May. However, job conditions could be such that satisfactory productive results could be obtained by working the clean-up crew on both days. Notes should be made on the Job Schedule Bar Chart to indicate such changes. A copy of the Job Schedule Bar Chart should be distributed with each copy of the Job Schedule.
- (3) Shop Scheduling. Normal shop scheduling procedures will then be followed, at a thoroughly alerted group of supervisors will be better able to supervise and assist the work to its scheduled completion.

JOB SCHEDULE MANNTENANCE MANAGEMENT) MANAGE O 180-000 100-00 Appendant According 100-00			TBMTAT	TENTATIVE SCHEDULE	<b>3</b>		FINAL SCHEDULE	CHEME		
			3	5-1-84			7312011	lt .	,	
CONNEAT STOKEHOUSE BUYDING NO. 32 INTO THEE OFFICE BREAS	10.3	2 INTO	THEE	DEFIC	E PRE	ដ	. 7864.0	978		
S JOB SELENGATES	O. P.	TARE	CHAIR STAINS IN SVI.	2//2	7 MB	7 WERLY LAGRACIA SOCIAL	7)11	- KW	2//2	26/2
Bergier Civilians		35.00					3	9	95.	7
L'INCLURE CLIUNES		AND BILK	CO PATR 14 PAG				70	F	FC:	
2 ORDER MRVY STOCK	1	20 APP	20 APR 28 APR				03	37	121	147
3 BUILD PARTITIONS	٥	. I MARY	3 May	೩			0.1		24	10
4. new Panel, E.M.T., wiring	7	Party	# PFEN	114			71	HII		39
S. STERM PIPES (ACCESS RACE)	15	-	49.00	13			hı			•
6. PRINT EXTERIOR BULDING	8	IAM	4 Presy	87			15	S		=
T. WHIER PIPES (ACCESS PAER)	=	SMRY	10 mm		भर					
B. SAND FLOOR, LAY THE	ō	4rm	4 MRY	67	651					
9 PAINT CEILINGS	70	1 ( MAY	15MB		122	ی				
IO. PRINT WALLS	20	157407	17 pm			Æ				
11. 10STALL LIGHT FIXTURES	77	17 PM	17 May 19 May		.,	32				
12 INSTAIL RADIATORS	15	15 M3	15 mm 15 mm			11				
13 INSTALL WATER COOLERS	=	15 MAY	15 MAY ISMAY			5				
IH. CLEAD IM	32	17 MAY 18 MAY	ISHAY			8				
NOTE TANGENDANS . SHORE	WEELLY CLEBELATORE			413	305	24.0		413	305	260
		à								

FIGURE À-9 Job Schedule 1; 1;

Tr |

[ ]

**[[** ]

Appendix E(3)

2021/54 1-3-86	studo, 16º 0-C	e for other craft worth.	11 11	J 6.			.44 13 .3	6						17.4	Makes prings o 18	7	26 26 Annual Tax. 26	mur 1 v 12
	L'high, Z'n 4" shoe ani ceiling o	es en laide of new office space				material bandling	(*x)2' = 12 aminadis	16' plates = 1 arminads										
der franke Cal Charles goder gann ac suppered june 1 vil ber gent ac day then	Categories and Categories Categories Constitute a partition by long.	side only (leave ninds open		43 install partition	CT-22:	Pus-> sigitional mater	26 studs 2"s6"x12"	.91 2, 14, 16.							· Mill. Der fere aberie be	Add and succession.		

The first control of the first	73 January 807	and the rate of the sale of th	7			
Lail 15th waterlike to unfer conict to existing users start in attic. Invital 3th color like conject tabing.  Lail 15th water and connect to existing user start in attic. Invital 3th color like conject tabing.  Let end. The tabing end.  Let end. The tabing e	-		27.72		17	1 3
Left 11% went and connect to existing west stab in attic. Invital) 2° cut  Left end. The compet tabing.  Left end. The competition of tabing.  Left end. The competition of tabing.  Left end. The competition of tabing.  Left end. The competition o				]		
lef end. The complet to coldet to supply line in cruel source. Install value and connect to suspent to him.  Lef end. The complet to him.  Lef end. The fittings/A sections  Lef end. The fittings/A sections  Lef end. The fittings/A sections  Lef end. The fittings him.  Leftendam material handling	[[estal]	II, usstellae in water cooler, comest to exists	Sustef		20.0	sauce.
	fast!!	I's" vent and consect to existing vent atach in at	- 1	3	3	ld water
	contro o	to cooler, cheect to supply time.	- !		3	
		1 1				
	PI			- 1		
			1.0		1	1
			11.	1	11 4	Į.
13   1   1   1   1   1   1   1   1   1	#-1.7		7.	_	٤.	
1	(rF-19)					
190   vent in satisf.   12 LF 5 fittings/4 sections             13 LF cold vator supply line             14 LF coper pipe-Teactions - Astroloads         15 coper fittings - 1 aminad         1	2-13	went and the	4.	1	4.	
12 15 5 fittings/A sections             13 12 15 6 fittings/A sections             14 15 coper pipe-Testines = Astulants           2	IT-190	vent in attic				
		32 LF 5 fittings/4 sections				
12 If & fitting/3 sections     1						
150 12 LF & filtring/3 sections  -5 Addriamal material hamiling  copper filtrings - 1 aminos  7  7  7  7  80 Address about the sections - 4 aminos  10 Address about the sections - 4 aminos  80 Address about the section - 1 aminos  10 Address about the section - 1 aminos  10 Address about the section - 1 aminos  10 Address about the section - 1 aminos  11 Address about the section - 1 aminos  12 Address about the section - 1 aminos  13 Address about the section - 1 aminos  14 Address about the section - 1 aminos  15 Address about the section - 1 aminos  16 Address about the section - 1 aminos  17 Address about the section - 1 aminos  18 Address	J-14	ì	9	-	9	j
43 LF caper placToactions - Asminads  coper fittings - 1 aminad	061-10	6 flicting/3 sec				
Attitional material ismaling 66 5 2  Attitional material ismaling 4 straight 4 s						
Copper fittings = 1 amised  The following the fittings = 1 amised = 1	PAR-S	Advisoral material bandling	ġ.	>	.2	
Copper fittings = 1 amised		copper pipe-Tsections =				ļ
The face change by the control of th		copper fittings = 1 achieved				
The face about the transfer of		•				
The face shall be seed for the face of the		4				
The face shall be the state of						
The face about the first face of the face		•"				
The face where the part of the face of the						
The face when jet to the state of the state						
The face when jet be seen when jet be seen when jet be seen seen jet be seen jet be seen jet be seen jet be seen jet jet jet seen jet						
Mare force admitted to the state of the stat					[.]	
Name and from American and State and		tone about to	2 1	įį	2	
20 12	ŧ	1975 entirenten.	-	1	1	*
patr 2 or 12			ì	I	Į	\$
			7477	Ę		

FIGURE 8-1 (1 of 6) Job Phase Calculation Sheet (NAVFAC 11014/23)

The state of the s

M-1-1 428(109	d icd" uire and conduit. Install ii. Outlet bows for floutescent		-	3 -	-	.6 4 2.4.1		2.9 3 8.7	(Sam	s) 2.9 1 2.9		+		.6 3 1.8		-3 19 2.7		Manual Straigh of Straight of	Will all for heavy and	Mar. and the line	seus) or 12
And the CALCELATION Design to the CALCELATION DESIGN TO THE CALCELATION OF THE CALCELATIO	Electrical descriptions and the description of the state	Zune 4	******			Besove conduit, wire and baxes	(7 bones per 30" wire/combait)(2407)	Install conduit (using ladder)	(Includes banes)(425'-24'bones)(40LF"2 hones)	Install conduit (no laideri(suchules boxes)			ingiali parei and connect & circuits	Pull wires uning ladder	(3 wires - 36')	Pull wires using ladder	(2 wires-400*) (Bes-te-bes)	No. torn aband to	78 sed seefell.		
PENTAL DES	Eleverical Econor (8) Acres (8) cti	Circo 2	I	-	197-JU	, J	CT-136	4-19	CT-82	-17	CT-81		1 5	ž	671-15	75-8	671-12	2384	Ī		

THE PRINCE CL	AND PRINCIPE CALCINCACYON SPEET		1			
1	1		107.25		4-(-)	
instanta a ted floritical-Sheet						
	of Tree Section			11		
Crev 2	Zome 4					
			0. 876 194		Ţ	
		•	114	11.	11 :	ļ.
Z.	Additional material handling	,	ą.	æ	1.4	
	# incandescent light flatures	res - 6 armlands				
	Jul' vire/combatt - 6 arabasds	eads				
	8 boxes - 4 attaloads					
	425*conduit - 1! arminade					
	4 batter ofte n 2 atmosds					
	1 panel with/circuits - 2 :	areloads				
			_			
			+			
•						ļ
			+			
i I jame	Bern Arms of the St.		Sections of Sum)	Sept. 2	25.8	
ı	#3 colimptes.		1	A. (875 pr. ).	-	<b>39</b> £
			1	Min. John Tone 144	Ĭ	35
			Ĭ	MIT # 12		

FIGURE 8-1 (2 of 6) Job Phase Calculation Sheet (NAVFAC 11014/23)

)[]

ripe					1
(Lement in	install steam sample and U.S. condensate lines to radiators (Connect into existing lines in crast space). (steel pipe). It	2 1 1 1	하십니		Serve Hose
Cree 2	to se t				
	4.00(27) 444	1		ı i	į
•		1.	1.	1 1	! •
1-0x	Remove inspilation - 2 sections	r.	-	7	
UI-121					
3-75	Install (2"-Zsections) stem supply	-1	7	2	
OT-205	lines				
		:	,	];	
0-77	Install 3/4" condensation lines	=		:	
QT-205	(1 secrios)	-			
		<u> </u>	].	]-	
<u>.</u>	Imminte Z steam line - 2 sections	·   -	-	1	
QT-112		+			
		-		7	
	Therete (1) The same	+			
OT-102		1			
7-4/2	Additional magerial benediting	ક્	4	7	
		-			
	series ion				
	1	-			
		_		5.8	
i	-	Was porte a	•	•	
Ħ	east for SNK NS and ANT-UNI astimutes.	1	ĺį		3
				1	•
			•	1	

14 TO 10 TO			Γ.	1	
****	2 5	457.104		4-4-84	
	<b>X</b>				
Inchall	Install Tak'ut' grp. hand, baseboard, and celling core	2	=	- 1	alde.
Install	Install chair rail on all interior walls. Install probung	Jan Jan	1	- 1	(Bo not
Install	Shor male at 1915 time. J				
			i		
Crew 2	Zume 4				
		698		Į	Ē
-	aprincipa del	ij·	11.	įĮ.	Į.
تِ	festall eve. heard	-	-	=	
70. L	5				
	j				
5-E	install 30 if ceiling cove	.3	_	٠.	
מ					
8	Install 30 LF basebaard	-:	-	<b>1</b> . ²	
CT-309					
15	Install door/jam	2.9	-	2.9	
S;-13					
SFF	Imstall (180 LF) chair rail	2.9	-	2.9	
(11-10)					
Z-49-2	Additional material banding	.111	7	. B	
	'A2 shis. gyp. hoard-2 nes-6 loads	\$		4.	
	30 1F ceiling cone . I arminad				
	projest   = pasoquesq &1 Of				
	specials 9-Bappion spect 31 381				!
	I deor/josh susy. * 2 mem-1 load			10.2	
- 1200	New days obsuite he	Errand Tray	• ]	Ξ	
į	178 entireles.	Mark 1885 from A	4	age on b	16*
			AN PARE THE	ĭ	*
		Ī	Mar 6 . 12		

FIGURE 8-1 (3 of 6) Job Phase Calculation Sheet (NAVFAC 11014/23)

THE STATE OF THE S	The case of a second	The sent had been the sent had been sent to the sent sent to the sent sent sent sent sent sent sent sen	The same Colors and Same Sales
arrloads	The control of the	Teceptacies and (1) sou th	Tescent light flatures, (6) receptables and  the empound
receptacles and (1) aut (1) .5 1 16 .5  Teneral handling  aterial			Tescent light flatures, (6) receptables and  Tescent light flatures, (6) receptables and  Tesceptables and (1) sur (h .5 !! -6  Tesceptables and (
		Carceller   1ght	Telegraphic light flatures, (6) receptables and  whenever light flatures, (6) receptables and  light flatures and (1) sui ch
			Teceptacles and (1) sut (h) 1  Teceptacles and (1
	Therefore 1 to the teacher of the te	TENCENT Light flatures, (6) receptables and  TENCETTE Bandling  TEND	Telegraphic livings (0) receptedes and common and commo
(1) Sul (h) Treeplacies and substitutes and su	Tracent light flatures, (b) receptables and  whe employed and (l) solich is in the content of th	receptacles and (1) nut th 18 12.6  Treceptacles and (1) nut th 2 1 6  Therefore interes and (1) nut th 2 1	Tracent light flatures, (6) receptables and  who empower  who empower  territories and (1) avi (h . 5 1 2.6  est flatures and (1) avi (h . 5 1 .6
\$   \$43)256   \$-3-64     \$   \$   \$   \$   \$   \$   \$   \$   \$		rescent light fincares, (b) receptacies and  was emercial  was emercial  and existing and (l) sur th 1 6  receptacies and (l) sur th 5 1 6  set fincares 18 areleads 54 18 6	recent light (lateres, (c) receptacles and  whe employee  Tracent light (lateres, (c) receptacles and  Tracent
1. Test (b) receptacion and analysis (c) receptacion and analysis (d) receptacion and analysis (d) sur (h	rescent light (lateres, (b) receptacles and  was successfully (lateres, (b) receptacles and  terestrates and (l) sui th .5 1 .6  receptacles and (l) sui th .5 1 .6  set flateres and .6 1 sui th .5 1 .6  set flateres and .6 1 sui th .5 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flateres and .6 1 sui th .6 1 .6  set flater	receptacies and (1) sur ch 3 1 6  Secretarial heading  est flatence and (1) sur ch 3 1 6  Secretarial heading	
(1) Sul (h) (c) 18 (e) (f) Sul (h) (h) 12 (h)	Tracent light flatures, (6) receptacles and  was supported  was supported  was supported  was supported  see diagence and (1) not the 1 1 1 1 1 1 1.	rescent light fincares, (6) receptacies and  was encourant  as a contract of the contract of t	rescent light (lateres, (b) receptables and  whe employee  whe employee  whe employee  whe employee  whe employee  whe employee  and
		rescent light (lateres, (6) receptacles and  rescent light (lateres, (6) receptacles and  light (lateres and (1) not th .5 1 .6  set flavores and (1) not th .5	
1. Tes			recent light (lateres, (6) receptacles and  was employed  was employed  was exceptacles and (1) avi (h 1 12.4  receptacles and (1) avi (h 1 12.4  est flateres and (1) avi (h 1 13.4  est flateres
	Tracent light (lateres, (6) receptables and  whe smooths  whe smooths  tracent light (lateres, (6) receptables and  tracent light (lateres, (6) receptables, (6) receptab	Tracent light (laters, (6) receptacles and  Tracent light (laters,	recent light flatures, (b) receptacies and  was emercian  as a superior and as a sup
1. Tes		receptacles and (1) mu ch 5 16 6 18. 6 6 18. 6 .	receptacles and (1) munch 1.5 1 .5  receptacles and (1) munch 1.5 1 .5  est flaters and (1) munch 1.5 1 .5
1. Tes (6) receptacles and (7) sur (8 (8 (9) 12.6 (1) sur (8 (1) 12.6 (1) sur (8 (1) 12.6 (1) sur (8 (1) 12.6 (1) sur (1)	Traccent light (lateres, (b) receptables and  whe employee  where is a factor of the control		
1. Test 18 12.6 (1) av. (8 2.74 18 2.4 (1) av. (8 2.74 18 2.4 18 2.4 (1) av. (8 2.74 18 2.4		rescent light (lateres, (6) receptacles and  who employees  who employees  Texceptacles and (1) sur ch 2 18 12.6  est flateres and (1) sur ch 2 18 12.6  est flateres and (1) sur ch 2 18 12.6  est flateres and (1) sur ch 2 18 12.6	
1. Tes 7. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.			
1. Tes		receptacles and (1) sur ch 5 1 16 6  Instructed heading  est districts and (1) sur ch 5 1 16 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6  The chartest and (1) sur ch 5 1 6	Tracent light flatures, (6) receptables and  tracent light flatures, (7) receptables and  tracent light flature
1. Tes (6) receptacles and (7) sur (8) (8) (9) (1) sur (1) sur (1)			rescent light flatures, (b) receptables and  whe employee and (l) sur ch . 3 % . 6  secretables and (l) sur ch
	rescent light flatures, (6) receptacles and  was summones  who summones  Tracent light flatures, (6) receptacles and  tracent light flatures, (7) receptacles and  Tracent light flatures  and continue and (1) set the characters  are flatures a	rescent light (lateres, (6) receptables and  rescent light (lateres, (6) receptables and  substitute and (1) suit th .5 1 .6  receptables and (1) suit th .5 1 .6  saterial harding  est flateres = 18 arclands .54 18 .5	
1. Tes			
1. Tes (6) receptacles and (7) sur (8) (8) 12.6 (1) sur (8)			
1. Tes		receptacles and (1) sur ch 5 1 16 6  Indicates and (1) sur ch 5 1 1 6  East instance of sureloads 5 1 6	
Curren, (6) receptuacies and  Curren, (6) receptuacies and  Curren, (6) receptuacies and  Curren, (6) receptuacies and  Current, (6) receptuacies and  Current, (7) receptuacies and  Current, (8) receptuacies and  Current, (9) receptuacies and  Curr			
	Cancernt   Light   Latures, (b)   Feceptacles and		receptacles and (1) munch 1.5 1 1.6  steertacles and (1) munch 1.5 1 1.6
		reacent light flatures, (6) receptacles and  unterprocess flatures (5) receptacles and  unterprocess (1) sui (1) 1 12.0  saferial hamilies 24 16 4 16	rescent light flatures, (6) receptacles and  wh empower  wh empowe
Cures. (6) receptacies and  Cures. (6) receptacies and  Cures. (7) receptacies and  Cures. (8) receptacies and  Cures. (9) receptacies and  Cures. (1) receptacies and  Cures. (1) receptacies and  Cures. (2) receptacies and  Cures. (3) receptacies and  Cures. (4) receptacies and  Cures. (5) receptacies and  Cures. (6) receptacies and  Cures. (7) receptacies and  Cures. (8) receptacies and  Cures. (9) receptacies and  Cures. (9) receptacies and  Cures. (1) receptacies and  Cures. (2) receptacies and  Cures. (3) receptacies and  Cures. (4) receptacies and  Cures. (4) receptacies and  Cures. (5) receptacies and  Cures. (6) receptacies and  Cures. (7) receptacies and  Cures. (8) receptacies and  Cures. (9) receptacies and  Cures. (1) receptacies and  Cures. (2) receptacies and  Cures. (3) receptacies and  Cures. (4) receptacies and  Cures. (4) receptacies and  Cures. (5) receptacies and  Cures. (6) receptacies and  Cures. (7) receptacies and  Cures. (1) receptacies and  Cu	reacent light flatures, (6) receptacles and  was suppose  was suppose  the contract of the con	rescent light (lateres, (6) receptables and  rescent light (lateres, (6) receptables and  who supported  who su	recent light flatures, (6) receptables and  untemporum  untemporum
Lures, (6) receptacion and  Lures, (6) receptacion and  Lures, (7) receptacion and  Lures, (8) receptacion and  Lures, (9) receptacion and  Lures, (1) receptacion and  Lures, (1) receptacion and  Lures, (2) receptacion and  Lures, (3) receptacion and  Lures, (4) receptacion and  Lures, (5) receptacion and  Lures, (6) receptacion and  Lures, (7) receptacion and  Lures, (8) receptacion and  Lures, (9) receptacion and  Lu		rescent light finteres, (6) receptables and  was empower  a man a	
1) Illusicacent light flatures, (6) receptables and res.  1) Illusicacent light flatures, (6) receptables and res.  1) Illusicacent light flatures, (7) resembles and res.  1) Illusicacent flatures	receptacles and (1) suith the manual transmission of the state of the	rescent light fintures, (6) receptacies and  une memorine  une memorine  in the contract of the response to the receptacies and  in the rescent factores (1) see ch (2) 15 12.6	rescent light (incures, (6) receptacies and  was encourse  at a particular and (1) suich (1) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1	Cancert   1ght   Incirces   (6)   receptacles and	rescent light (lateres, (6) receptables and  who expected flateres (5) receptables and  listerescent flateres (5) receptables and  the statement of the stateme	rescent light flatures, (b) receptables and  was empower  at empower  at empower  by the content flatures  content to the content flatures  content to the content flatures  c
1			
1	reacent light flacures, (b) receptacles and  was macross  was macross  Teacent light flacures, (b) receptacles and  to a promote and the second and the seco	Tracent light (lateres, (c) receptacles and  who management factores (d) receptacles and  light (lateres and (l) mot th .5 1 2.6	Tracent light flatures, (6) receptables and  une membrane
1	Cancern	rescent light (incures, (6) receptacies and  was empower  where seemed in the reserve to the receptacies and  was empower  and empower  by the rescent factores	
1]		reacent light fininces, (6) receptacies and  une memorine	
1	Cancert   1ght   Incures   (b)   receptables and	rescent light finences, (6) receptacies and  was empower  a man a	Tracent light flatures, (b) receptables and  we empower  we empower    Company   Compa
1]		reacent light flatures, (6) receptacles and  unterporter  unterporter  in the control of the con	
2   6   6033256   6-3-64   1]	Cancern   Later   Cancern   Cancer	rescent light (interes, (b) receptacies and  was summing a market filteres (b) receptacies and  was summing a market filteres (b) receptacies and  the summing a market filteres (c) receptacies (c) receptacies and  the summing a market filteres (c) receptacies (c) receptacies and  the summing a market filteres (c) receptacies (c) receptaci	Tracent light flatures, (b) receptables and  ust empower
1) Ilworchernt light fixtures, (6) receptables and res.  Tree.  The A transmission and the	CENCEPT   Light   Lacates 4   647   1556   4-7-64	reacent light fininces, (b) receptables and  the memory and the fininces (c) receptables and  the memory and the fininces (c) receptables and  the memory and the fininces (c) receptables and	
1)	reacent light flatures, (b) receptacles and	rescent light (interes, (6) receptacies and  the summan of	Tracent light flatures, (6) receptables and
1   1   1   1   1   1   1   1   1   1	CENCENT   Light   Lateries, (6) receptacles and	reacent light fininces, (6) receptables and  teneral light fininces, (6) receptables and	Concept light flatures, (6) receptables and   4-3-64
1)   postencement	reacent light flactors, (6) receptacles and	rescent light finences, (6) receptacies and	reacent light flatures, (6) receptables and
1) liborchern light fixtures, (6) receptables and res.	rencest light flatures, (6) receptables and	reacent light flatures, (6) receptacles and	recent tight flatures, (6) receptables and
1) ligorcacent ight fixtures, (6) receptables and res.	reacent light flatures, (6) receptacles and	rescent light flatures, (6) receptacies and	rescent light flatures, (6) receptables and
1) liborcacent light fistures, (6) receptacies and res.	reacent light flatures, (6) receptables and	reacent light flacures, (6) receptacles and	recent tight flatures, (6) receptables and
1) liworencent light fixtures, (6) receptables and res.	rencest light flatures, (6) receptacles and	rescent light (latures, (6) receptables and	rescent light flacutes, (6) receptacles and
1) lippicatent light flatures, (6) receptables and	rescent light flatures, (6) receptables and	rescent light flatures, (6) receptables and	rescent light flatures, (6) receptables and
1) liborcacent light fistures, (6) receptables and	rescent light flatures, (6) receptacles and	reacent light flacures, (6) receptacles and	rescent light flatures, (6) receptables and
1) ilworchcent light flatures, (6) receptacics and	rencest light flatures, (6) receptacles and	rescent light flacures, (6) receptacies and	rencemt light flatures, (6) receptacles and
1) Theorement light flacutors, (6) receptables and	reacent light flatures, (6) receptacles and	restrict to the fibrares, (6) receptables and	rescent tight fixtures, (6) receptables and
1) Theorement light flavores, (6) receptables and	rescent light flatures, (6) receptables and		rescent light flatures, (6) receptables and
2 4 603256 4-3-64	1 to construct to the c	2 4 647356 4-3-64	6473556 4-3-64
2 4 6471456 4-3-64 t			
2 4 6473556 4-3-64	19-17-27 ( 19-17-27 (	1 407155 4-3-64 Tennes and a 107155	
2 4 6473556 4-7-64			
	TOTAL CONTROL OF THE PROPERTY	The state of the s	The state of the s
		1	Control of the second of the s

FIGURE 9-1 (4 of 6) Job Phase Calculation Sheet (NAVFAC 11014/23)

111

2-1-1

Cres 2

CI-2:3 B4-C C1-13

- =

Job Phase Calculation Sheet (NAVEAU 11014/23)

			•														5	•	
		1 1	. •			7.7		٠.							1.2	-1	1	Ţ	
	]	11 4 1 3 1	-		floor	2	I	3		I		I					Ma. (Ses free for	TATE AND PARE THE	Mc13 0 12
2 4 7 7 COX			٠ ٠	1		•		=								MERS SCrafe & Laterated Trans	THE CO.	1	Î
Market Ca. Con., Nicol. Sect. 1739  Market Steeler 27 sec. 1739  Market J. Apr. 1740  Market	2) 10-section		laser Cooler		İ	Install (2) radiators		Additional material bandling	1 fountain							The form about to	7.873 estimates.		
MAN AND AND AND AND AND AND AND AND AND A	114		٠ آ	eT-129		9-01 1		PWA-5								71. 23000	ŧ		

	23 PELOTO 254	mire same reg.				
Amings)  Zone 6  Lacial (4) availage over violates on east side and south sides of uffice and south sides of uffice and south sides of uffice and south sides of unitarity and unitarity u	T. C.	-	1073454		13	*
	Metal 5 S Metal 1 S Metal	nes genings over viet	outh sid-	9	1110	
	2	dags)				
	- 11	Zane 4			1	
		manufacture and	ij	11	12	įį
4 Amelings - A smileodes 4 Amelings - A smileodes 5 - Additional material heading 6 - A - B - B - B - B - B - B - B - B - B	-  -	l	-	4 -	. 0	
4 Amelings — 4 amilodes  4 Amelings — 4 amilodes  7	121-141					
4 amelags - 4 amilades 4 amelags - 4 amilades  1						
A sheetage - A strationds  2.  3.  3.  3.  3.  3.  3.  3.  3.  3.	FUA-5	idditional material bandling	9.0	J	7	
Short dended by Section 1.2  Short dended by		6 auniage = 6 armicade				
The face about to the face of						
The feet about to the control of the						
The feet about the transfer of						
The free shared to be seen to be						
The face denoted to the control of t						
The face denoted to the control of t	-					
The face denief to the control of th		4				
The face denief by Black for the face of t						
The face denic by the state of		•				
The face about to the state of						
The face shared to be the state of the state						
The fee about the transfer of						
But from admind the best of th						
But from admind to the control of th						
But from admit & but from a but from fro						
Note from about the base of th					6.2	
Welt, (20% from American) Welth, and Squad 1 and Secting Dec 1 2		a form advanted to	Part of the last o	įĵ	*	
$\square$	1	-ffre metimotos.	tel type	1	1	*11
21 a0 lisa			e was	į	ī	==
			Ĭ	ĩ		

FIGURE 8-1 (5 of 6) Job Phase Calculation Sheet (NAVFAC 11014/23)

				4-3-64	İ
	01 -	16:3: 56			2
Parist Specifical	and tape past time or both cides " Life.	Cal searly	177	3	rater ve on
on dea	age (all (2) coat work).				
1 1			11		
1221	/une c			ī	
7		il·	11.	11	1
-	Spackle and tape nor parefitten	1.51	-	12.3	
F1-119					
77	Roller saist wall's and ceilings	400.	7 320	17.5	
11-11	(walls - 1520 SF) (collings - 1800 SF)				
.3-0%	Brash paint (3) doors - 1 stde/2 contr.	4	2	1.2	
21-17	14,2 = 3, 2, 2, 1				
3-0;	Stank Burn (3) Cour (rames - 1 side/	4	-	1	
461-15	- trus				
4-84	Pales (6) viales 2 cons		1.	,	
11-154	W = 6'H - 6(b)		•		
					Ì
3-r.	Paint chair rail - 2 coats	1.15	2	2.7	
F1-17c	(1801f x 4" W)				
×	Prane and paint aprinkler ifnes	0164	120	-	
1.1-49	(230 LF) (.0082 hrs. 1F x 2 cuats -				
	0164 his. : F)				
17 17 17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Para form admired to	Was (Course Cottonied Team)	ij	7,7	
į	M estimatee.	WHAL LOTS free		4	
		, i	1	Ţ	
		1	]:		

	Literated Freezy	Married Free J																				
E. 5.	Bes down claim is be. Best down claim is be. Bestered Tea.	Best farm about the best force of the best force	E. 5.								International of the second of	Faler (6) Badiatore - 2 coats  into pres per 10b phase  10 1 10 10 10 10 10 10 10 10 10 10 10 10	Paler (6) Badiatore 2 coats	Interest (a) Estimators (b) Estimators (c) (c) Estimators (c) (c) Estimators (c) (c) (c) (c) (c) (c) (c) (c) (c) (c)	Internation of the section of the se	raict feb gadiators 2 coats  in page 100 000 000 000 000 000 000 000 000 00	Palet (b) Ediziore - 2 conte	Paler (6) Estators - 2 coars	Faler (6) Badiatore - 2 coats  tub area are 10b abare 9 1 9	Tries (6) Badistors - 2 coats  tinh pres per 10b phate 9 1 9	Paler (6) Badiatore 2 coats	Page 1888 1888 1888 1888 1888 1888 1888 18
B < 5	Bless down admits to the best of the best	The face of the fa	B < 5							Price feb grainter 2 coats  in property to the grain of t	Faler (6) Badiatore - 2 coats  this pres per 10b phase	Paler (6) Bediatore 2 coats	Tales (b) Balistors 2 coats  the pres per ich phase 2 coats  the pres per ich phase 2 coats	Paler (6) Badiators - 2 coats in pres per 10 phase	Tales (b) Balistors - 2 coats  the area per independent - 2 coats  the area per independent - 3 i i i i i i i i i i i i i i i i i i	Paler (6) Estatore 2 colds    Paler (6) Estatore 2 colds	raise (a) Esdiators— 2 coats  into pres per co phase  into pres per co phase  .9 : .9	Falst (6) Estistors 2 coats  lith stree set tob share  1. 9 1 1.9	PAIGT (6) Eddistore 7 costs (7) 1	Paler (6) Badiatore - 7 coats	Participants of the property o	rate personners of the properties of the properties of the personners of the personn
E . 25.	Bless dozen admirable by the state of the st	Banda George 45 . R. Banda George 45 . R. Banda George 45 . R. Banda George 45 . R. Banda George 45 . R. Banda George 45 . R. Banda George 74 . R. Banda Geo	E . 25.							Palet (6) Edizione 2 conte	International of the second of	Faler (6) Badiatore - 2 coats  into pres per 10b phase 9 1 9	Paler (6) Badiatore 2 coats	Interest (6) Estimators 2 conts	Internation of the section of the se	Palet feb Endiators 2 coats  in page 100 page 10	Palet (b) Ediziore - 7 cold   p   p   p   p   p   p   p   p   p	Faler (6) Estators - 2 coars	Faler (6) Badiatore - 2 coats  tub area are 10b abare 9 1 9	Faler (6) Badiatore - 2 coats  tub area are 10b abare 9 1 9	Paler (6) Badiatore 2 coats 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Page 1888 1888 1888 1888 1888 1888 1888 18
E S.	Bles down almost 8 to 15.28   Sept.	These forms admired to the Control of the Control o	E S.							Price feb gadinore 2 conts	Faler (6) Badiatore - 2 coats  in pres per job phase  in pres per job phase	Paler (6) Bediatore - 7 coats	Tales (b) Balistors 2 coats  this area per ich phase 2 coats  this area per ich phase 2 coats	Paler (6) Badiators - 2 coats in pres per 10 phase	Tales (b) Balistors - 2 coats  the pres per ich phase - 3 coats  the pres per ich phase - 3 coats	Paler (6) Estatore 2 colfs	raise feb Esdiators 2 coats  into pres per 10 phase  into pres per 10 phase  10 phase	Paler (6) Bediatore 2 coats	PAIGE OF BARBOOK 2 CORES 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	PAIGT (6) Eddistore 2 costs	Particular and the second seco	rate per color of parts of the personners of the
E . 25.	Bless down admired in the Control of	Banda George (45 / R)  Banda George (45 / R)  Banda George (44 / R)	E . 25.							Palet (6) Estatators 2 coats	Paler (6) Redintors - 7 conts	Filer (6) Badistore - 2 coats  tinh pres per ich phate 9 1 9	PAIGE 161 Estatore 2 coats  into pres per 10 phase 2 coats  into pres per 10 phase 2 coats	rates for gold and a second and	Pales for places of the places	Palet (a) Esdiators 2 coats  into pres set to phate 9 : 9 : 9	Palet (6) Estatatore 2 coats	Faler (6) Balistore - 2 costs  fully pres per 100 phate	Taler (6) Balistore - 2 coats    10	Into pres per 10 phase 100 cm   10 phase 100 cm	Paler (6) Estintore 2 conts	Paris Tel Baliators 2 coats    Paris   Cal Baliators 2 coats   Paris   Paris
E S	Bles down admits it is a second of the secon	There is the state of the state	E S							Friet (a) Estitutes 2 coats  first pres per 10 phase	Taler (h) Badiatore - 2 coats  tub area per ich phase - 3 coats	Paler (6) Estatore - 2 cone	Taler (6) Bediatore 2 coats    Paler (6) Bediatore 2 coats	Taler (6) Badiatore 2 coats  this pres per inh phase	Tales (6) Badiators 2 coats	Paler (a) Estintante (a) 11 - 3   1 -	Price feb Endiators 2 coats  in the Pres per cob place  in the Pres per cob	Paler (b) Edizione and and and and and and and and and and	Faler (6) Estimotors - 2 cons	Paler (6) Estimosons of the Prince of the Paler of the Pa	Palet (6) Baliztore - 2 coats  in present to plants.  in present to plants.	Paris and separation
1 S S S S S S S S S S S S S S S S S S S	Bles done after the bles from a fine and bles from the first from	Base down about the form	1 S S S S S S S S S S S S S S S S S S S							Puler (6) Estinguistics - 2 cone	Paler (6) Redintors - 2 conts	Taler (6) Badiatore - 2 coats    10   Presente   10   10   10   10   10   10   10   1	Taler (6) Balators - 2 coats  lith pres per job phase - 3 coats	Paler (6) Edizione 2 conte	Paler (6) Badiators - 2 coats inh pres per job phase - 9 1 - 9 1 - 9	Palet (6) Ediziore - 7 colf   10   10   10   10   10   10   10   1	Friet (6) Badistore - 2 cone	Faler (6) Bediatore 2 coats  tith pres per ich share 2 coats  1.9	Paler (6) Bediatore 2 coats	Paler (6) Estistate 2 coats	Participants of the property o	Paler (6) Badiators 2 coats in property (coats and palers) in
E ST.	Part of the fact o	The form admitted by the control of	E ST.							Palet (b) Edizione 2 cold	Interest (6) Redizione - 2 cones	Faler (6) Estimotors - 2 cons	Paler (6) Badiatore 2 coats	Tales (b) Bediators - 2 coats  inh pres per job phase - 3 coats	Paler (6) Badiatore - Coats	rater (4) Estatore 2 costs  into pres per 10 physic 2 costs  into pres per 10 physic 3 costs  into pres per 10 physic 3 costs	Pariet (a) Endiators 2 conts  in pres per 10 phase 2 . 9 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Palet (6) Estatatore 2 coats into pres per 10 Phate 9 9 9	Paler (6) Balatore - 2 coats  lith pres per 10 phate - 10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Paler (6) Balatore - 2 coats  lith pres per 10b phate - 9 19	Paler (6) Bediatore 2 coats  tith prep per 10b phare 2 coats	Paler (6) Estinories (2) 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 3 1 2
1 · 5 · 5	Bles down adment if the Control of t	Best form state for the first	1 · 5 · 5							raist feb gadiators 2 coats  in processors  in page 1 coats  in page 2 coats  in page 2 coats  in page 2 coats  in page 2 coats  in page 2 coats  in page 3 coa	Faler (6) Badiators - 2 coats inh pres per job phase	Taler (6) Bediatore 2 coats	Taler (6) Badiatore 2 coats  in presented in particular (1) 1 10	Palet (6) Redintors 2 conts	Tales (6) Badiators 2 coats  in presented to place 2 coats  in presented to place 2 coats	Paler (6) Badiatore 2 coats  tub area art tob share  1	Pales for 10 place of 10 place	Falst (6) Bediators - 2 coats  lith pres per 10b phase - 3 . 3 . 3	PAIGT (6) Edizione 2 colic	Paler (6) Badiatore - 7 coats	Participation of the property	rate for graduation and an analysis of the professional teachers and the first season and the present of the pr
B. 5.5	Base down when his year. See 1 Section 14 Se	The face along the face of the	B. 5.5							Palet (6) Edizione 2 conte	Paler for phase in the plase of the phase in the plase of the phase of	Faler (6) Badiatore - 2 coats  into pres per 10b phate 9 1 9	Pales for galacter 2 colds	Palet (a) Eadinors 2 conts	Pales for places of the places	Pariet (b) Ediziore 2 costs  into pres per 100 phate - 2 costs	Palet (6) Estatators 2 conts    Palet (6) Estatators 2 conts	Faler (6) Balators - 2 coats  Jub pres per 100 phate	Taler (6) Balatore 2 coats  tinh prep per ich phare 2 coats  1.9 1.9 1.9 1.9	Taler (6) Balatore - 2 coats  tinh prep per ich phare - 9 1 . 9	Paler (6) Bedistore 2 costs 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	P. De golumes tast  Tales (a) Eddiators 2 coats  Inb pres per 10b plate  1
E S.	Bles down admit if the Control of Section 15, 8 interest Fact 15, 10 int	These forms about the first the first the first	E S.							Print (6) Edizior 2 coats  in promine in print (6) Edizior 2 coats  in print (6) Edizior 2 coats  in print (6) Edizior 3 coats  in print (6) Edizior 3 coats	rate (b) Badiatore - 2 coats  tub area net ich share - 9 1	Friet (6) Redintore - 7 conts  into prep per 100 Phate - 7 conts	Taler (6) Bediators 2 coats    Paler (6) Bediators 2 coats	Faler (6) Badiatore - 2 coats  into pres per cab phase - 9 19	Tales (6) Badiators 2 coats	PAIGE 161 Edition blue of the property of the	raict feb Esdiators 2 coats into pres per co place. 2 coats into pres per co place. 3 coats	Failer feb Endistors 2 conts	Friet (6) Bedistore - 2 costs  into prep per 100 Phate - 3 costs	Paler (6) Badiators - 2 coats  into pres per 100 Phate - 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Tries (6) Badistors 2 coats	Pariet (a) Edition 1-2 coats  Fair (b) Edition 2-2 coats  Fair (c) Phare (c) Phare (c) (c) (c) (c) (c) (c) (c) (c) (c) (c)
1	Base down after the base of th	Banda Control (45 / R)  Banda Control (45 / R)  Banda Control (44 / R)	1							Puler (6) Estinguistics - 2 cone	Parente man commerce of the properties of the pr	Taler (6) Badistore - 2 coats  Jub pres per ich bhare 9 1 9	P. Pr. Coll Edizione	rate for Bedistors. 2 costs.    Particle for Bedistors. 2 costs.	Paler (6) Redintors - 2 conts	Palet (6) Ediziore - 7 colf   10   10   10   10   10   10   10   1	Paler (6) Badiators - 2 coats  july pres per 100 phate - 3	Faler (6) Badiatore 2 coats  tith pres per ich share 9 1 9	Paler (6) Estistate 2 coats	Taler (6) Bediators 2 coats	Paler (6) Eddiators 2 coats	Paris Series 11st 11st 11st 11st 11st 11st 11st 11
S S S S S S S S S S S S S S S S S S S	Bles done admit it is a second of the second	The same name and the same name and same  S S S S S S S S S S S S S S S S S S S							Friet (a) Endiators 2 coats  in present to playse 9 : 9	Tales (6) Badiators - 2 coats	Puler (6) Redistors - 2 cons	Paler (6) Badiatore 2 coats	Tales (6) Bediators 2 coats  tub area are ich abare 2 coats  1	Paler (6) Badiatore 2 coats	Paler (a) Badiatore 2 coats  into pres per 10 phase  into pres per 10 phase  10 phase	Palet feb Endiators 2 coats  in property of the Palet of Palet Coats  in property of the Palet	Paler (6) Edizione - 7 conse	Faler (6) Badiators - 2 coats	Faler (6) Estimotors 2 cons	Taler (6) Badistore 2 coats	Paler (6) Redistors 2 coats  tub prep per 10 phase 2 coats	
# 5 5 5	Bas does done of the state of t	Band Room and the State of State Sta	# 5 5 5							Paler (a) Badiatore 2 coats	Paler (6) Redintors - 2 conts	Paler (6) Bediatore 2 coats	P. Pr. Collins and	Palet (6) Endinture - 2 conts	P. Jer (6) Badiatore - 2 coats inh prep per job phate - 9 1 . 9 1 . 9	Palet (6) Badiatore - 2 coats  tub pres per tob phare - 9 1 - 9	Paler (6) gadiatore 2 coats    Paler (6) gadiatore 2 coats   Paler (6) gadiatore 2 coats   Paler (6) gadiatore 2 coats   Paler (6) gadiatore 2 coats	Faler (6) Bediators - 2 coats  lith erre per 10b share - 9 1 - 9	Paler (6) Badiatore - 7 coats  lith pres per job plate.	Paler (6) Bediatore 2 coats	Pales for the Balatore 2 coats (9 1 2.9 1	raise feb Badiators 2 coats  in property of the badiators 2 coats  in property of the badiators 2 coats  in property of the badiators 2 coats  in property of the badiators 2 coats
	Base date after 18 and	The same address of the sa								Palet (b) Edizione 2 conte	rates for selection of the selection of	Faler (6) Balatore - 2 coats  lish pres per 10b phate - 9 1 1 19	Paler (6) Estistore 2 colds  into pres per 10 phase 2 colds	raist (6) Badiators 2 costs	Paler (6) Estintente Conts  Into pres per 10 phase  10 present the	Part of the Endiators 2 coats  in part of phase 2 coats  in part of phase 2 coats	Palet (b) Edizione - 2 conts	Puler (6) Estators - 2 coars	Faler (6) Badiatore - 2 coats  fully prep per 100 phate	Faler (6) Badiatore - 2 coats  fully pres per 100 phase 9 1 9	Paler (6) Redistors 2 coats  tith pres per ich share 2 coats	Paler (6) Eddinor - 7 colfs
	Blass dozen adment it was a server of the server adment it was a server of the server adment it was a server of the server of th	Been state to the state of the								raist feb Badiators 2 coats  inh pres pef ich share	Faler (6) Badiatore - 2 coats	Friet (b) Ediziore - 2 conte	Tales (b) Badiators 2 coats  tub pres per job phase  1.9	Paler (6) Badiatore - 2 coats	Tales (b) Badiators - 2 coats  tub pres per job phase - 9 1 - 9	Paler (6) Badiatore - 2 coats	Pales for 10 place of 10 place	raics feb Redistors 2 coats  in properties feb Redistors 2 coats  in properties and place 3 coats  in properties and place 3 coats	Failer (6) Endiators - 2 coats  in the pres per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob p	Palet (6) Estatore - 7 conts  into pres per 10 phase - 7 conts	raics for Badiators 2 coats  in pressure 2 coats  in pressure 2 coats  in pressure 2 coats	Parameter and separation and separat
	Part of the fact o	The same name and the same name and same							Palet (b) Edizione 2 conte	raice (6) Endicion 2 conts	Faler (6) Balatore - 2 coats  lish pres mer iob phase 9 1 9	Pales for galacter 2 colds	Palet (6) Badiators 2 costs	Pales for Balaster 2 coats  Into pres per cob place 2 coats  Into pres per cob place 2 coats	Part of the Endiators 2 coats  into pres per cob phase 9 : 9	Palet (b) Edizione - 7 colds	Puler (6) Bediators - 2 coats fith pres per 100 phate	Faler (6) Badiatore - 2 coats  into pres per 100 phate 9 1 9	Faler (6) Badiatore - 2 coats  into pres per 100 phate 9 1 9	raign (6) Redistors 2 coats tith prep per ich phaise	Paler (6) Estatore 2 colts 9 1 2 9 1	
	Bas does when it is a second of the second o	The face about the face of the								raist feb Badiators 2 coats inh pres pef ich share  inh pres pef ich share  inh pres pef ich share  inh pres pef ich share  inh pres pef ich share	Faler (6) Badiatore - 2 coats  inh pres per job phate - 9 1 - 9	Failer feb Bediators - 2 coats into pres per cob place  into pres per cob place  into pres per cob place  into pres per cob place  into pres per cob place  into pres per cob place  into pres per cob place  into pres per cob place  into pres per cob place  into present c	Tales (6) Redistors 2 coats  tub pres per ich share 2 coats  1	Faler (6) Badiators - 2 coats	Tales (b) Redizione - 2 coass	Paler (6) gadiatore - 2 coats	Paler (a) Esdiatore 2 colfs	raics feb Esdistors 2 coats  in the Pres per 10 phase  in the Pres per	Failer feb Bediators - 2 coats  in a series per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob place  in person per cob p	Palet (6) Estatore - 7 conts  into pres per 10 phase - 7 conts	Taler (6) Redistors - 2 coats into pres per job phate - 2 . 9 1 2 . 9	raice for Redictors. 2 coats.
	Part of the fact o	The same name for the same same same same same same same sam								Faler (6) Badiators - 2 coats  July prep per 100 phare  100 prep per 100 phare  100 prep per 100 phare	Paler feb Radiatore - 2 coats	raign (6) Redizione - 2 coais	Faler (6) Rediators - 2 coats   1   2   2   2   2   2   2   2   2   2	raice (6) Endiators 2 conts	Paler (6) Redintors - 7 coats in pres per job phase	Taler (6) Badiators 2 coats  hib prep per job phase9 29	Faler (6) Badiators - 2 coats  Jub pres per iob phare  - 9 1 - 9	rates for Redizione - 2 coais	Paler (6) Estistore 2 costs	Taler (6) Redistors 2 coats  lith area art tob abare 2 coats	Paler (6) Eddistors 2 costs (9) 1 .9	Pales for ablase 2 costs 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
	Part of the fact o	The same name and the same name and same							Friet feb Endistors 2 coats  in promise and promise an	Tales (6) Badiators - 2 coats  lith area art tob share	Palet (6) Redistors - 7 coats into pres per 100 Phate	Paler (6) Badiatore : coats	Tales (6) Bediators - 2 coats	Paler (6) Badiatore : coats	Pales for pales of the pales of	rates per ob place.	Fair feb Endistors 2 conts	Faler (6) Rediators - 7 coats into prepared ich Rediators - 7 coats into prepared ich Rhaise	Faler (6) Rediators - 2 coats into prep per 100 Phate - 2 coats	Taler (6) Balators 2 coats  hith prep per 10b phate 9 1 2.9	Palet (6) Badistore 2 coats  in pres per 10b phate 9 1 9	
# 5 5 7	Bas town after 10 to 10	The face about the face of the	# 5 5 7							raise (6) gadiators 2 coats  tith pres per 10 phate 2 coats	Parente man commerce of the properties of the properties of the press seef to behave	Paler (6) Badiatore - 7 coats	P. Pr. Colors and Separation and Separation of Separation	Palet (b) Radiators - 2 coats in pres set to plate	Parente management of the properties of the prop	Tales (6) Badiators 2 coats	Paler (6) Redistors 2 coats	Taler (6) gadiatore 2 coats  inh prep per 10 phate  1 9 1 29	Paler (6) Badiatore 2 coats (9) 1 2 9 1 2 3 1 2 4 1 2	Paler (6) Badiatore - 7 coats (9) 1	P. De gammes una management p.	raics for Redistors 2 costs  in property of the Parking Costs  in property
	Page 2 Co. 1	The same name and the same name and same							Faler (6) Ediators 2 coats	raice feb Badiators 2 coats lith pres per ich share	Faler (6) Badiators - 2 coats fith prep per 10b phate . 9 1 2 9	Pales (6) Estistors 2 colds	P DE GAMES INEE  Tales (6) Eddiators ? colic  in property (6) Eddiators ? colic  in property (6) Eddiators ? colic	Paler (6) Esdiatore 2 coats (7) 1 2 2 2	Parties for godinators 2 coats	Failet feb Endiators 2 conts	Palet (6) Redistors 2 costs	Faler (6) Balators - 2 coats  lith prep per 10b phate - 2 . 9 1 9	Paler (6) Balatore - 2 coats  lith pres per 10b phate - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1	Paler (6) Badistore - 2 coats  tub prep per 100 phase - 3	Paler (6) Redistors 2 coats  tub prep per 10b phare 9 1 9	
	Bas town after 15 to 15	The same name and the same name and same							raise fet Badiatore 2 coats    coats	Faler (6) Badiatore - 2 coats	rater (6) Endiators 2 coats inh pres per 10 phase  inh pres per 10 phase  1 1 2	Tales (6) Badiators - 2 coats  tub prep per job phase - 3 coats	Faler (6) Bediators - 2 coats	Tales (6) Badiators - 2 coats	Paler (6) Badiatore - Coate	Paris September 188   Paris September 188	raics (6) Esdiators 2 coats	rater (6) Endiators 2 coats into pres per 10 phase  into pres per 10 phase  10 phase	rate (6) Endiators 2 coats lith pres per 10 phase	rue comments  The first (6) Redistors - 7 coats  This first per per 10 places	Paler (6) Redistors 2 coats inh prep per joh phase	
	Page after the page of the pag	2.5 . B MASS (2.5) 2.4								Paler (6) Rediators Colic	Paler feb Radiatore - 7 coats	Paler (6) Bedistore 2 costs	P. ST. (6) Redistors - 2 costs   1 costs   2 c	rain feb Endinture 2 conts	Palet (6) Redintors 2 conts	Taler (6) Relators 2 cons	Faler (6) Badiators 2 coats	Falst (6) Estimators. 2 coats	Participation of the property	Paler (6) Bediatore - 7 coats	Participation of the properties of the propertie	raise for Redistors 2 costs
	Page 1 (2.8)	The same name of the same name of the same								Fair feb Endiators 2 coats	rater (6) Badiatore 2 coats in present in plants	Faler (6) Rediators - 7 coats into pres per 100 Phate - 7 coats	Paler (6) Estatore 2 coats (9) 1 .9		Pales for Balators 2 coats  inh pres per 10 phase  1	raist feb Endiators 2 coats  into pres pef of phase	raict feb Endiators 2 coats inh Pres per job Phate 9 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Palet (6) Edizione - 7 conts  in part   part	Faler (6) Rediators - 2 coats into prep per 100 Phate	Paler (6) Redistors - 2 coats into prep per 100 Phate - 2 coats	Taler (6) Balatore 2 coats  his prep per 100 phate 2 coats	Faler (6) Badiatore - 2 coats
	Page date of the page of the p	The face about the face of the								Paler (6) Esdiatore 2 coats (7) 1 29	Parente in Redinion - 2 conts	Paler (6) Estatore 2 coats	P. Pr. Colors of	Palet (6) Redistors 2 coats in pres set (6) Phate	Faler (6) Rediators - 2 coats	Taler (6) Badiators 2 coats	Palet (6) Redistors 2 coats	Paler (6) Rediators 2 coats	Faler (6) Estintore 2 conts	rate for galators 2 costs	raice for Redistors 2 costs	raics for godinators 2 coats
	Page 1 (2.8)  Bas face after 10 to 1	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								Palet (6) Estateter 2 coats	raier (6) Badiatore 2 coats lith prepertion phase	Faler (6) Balatore - 2 coats	raist (6) Badiators 2 coats lith prep per 10 phase	Parente separation of parents in the present of the plants	Paler (6) Badiators 2 costs	Palet (b) Edizione 2 cold	Palet (6) Redistors 2 coats fith prep per 10 phate	Faler (6) Badiators - 2 coats	Faler (6) Badiatore - 2 coats	rafer (6) Bediatore - 2 coats	Paler (6) Redistors - 2 coats  tub prep per 10b phare - 9 1 2 9	Paler (6) Redistors 2 coats
	Bas town after 10 to 10	1								raist (6) Esdiators 2 coats	rates for 10 places and 10 pla	ran emercen.	Tales (6) Redistors 2 coats	Faler (6) Badiatore - 2 coats	Tales (6) Redistors 2 coats	Paler (6) Esdiatore 2 coats	Pales (a) Estistors 2 colds	raist (6) Esdiators 2 coats	ran emercent con the section of the	ran commerces  1	Palet (6) Redistors - 2 coats  lub pres per 10 phase - 3 . 9	Palet (6) Redistors - 7 coats  lith pres per 10 plates
	Page after the page of the pag	15. E. BRASS (25. E. B. B. B. B. BRASS (25. E. B. B. B. B. BRASS (25. E. B.								Faler (6) Badiators 2 coats	rain (6) Bediators. 2 coats.	raice fel Bedistore 2 costs (9 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	rafer (6) Bedistors - 2 costs	raict feb Badiators 2 coats lich eres est job share	raint (6) Endiators. 2 conts.	Paler (6) Redistors - 2 coats	Paler (6) Bediators - 2 coats in pres per job place	Faler (6) Bediators - 2 coats	Paler (6) gadiators - 7 coats	Paler (6) Bedistore - 7 costs	Paler (6) Badiatore 2 coats (9) 1 2 2 2	Paler (a) Balistorn 2 costs  lith pres per 10b share
	Part of the fact o	100 man and 100 ma								raict feb gadiators 2 coats	Falst (6) Bediators - 2 coats	raint (6) Endiators 2 coats inh pres per 10 phase	Paler (6) Badiatore 2 coats	Paler (6) Redistors - 2 coats   1 2 2 2 20 mins 144	Paler (6) Badiatore 2 coats	Paler (a) Badiatore 2 coats (a) 1 . 9	raise feb Esdiators 2 coats	Pariet feb Endiators 2 coats  inches area and to a blasse 9 1 1 9	raint (6) Endiators 2 coats inh pres per 10 phase	raier (6) Estintors - 2 coats inh pres per 10 phase	rate (6) Redistors - 7 coats  lith pres pet (c) player  lith pres pet (c) player	Paler (6) Redistors - 2 coats  Into pres per cob place
	Page 1 Pa	2.5. B BRASE (2.5) 2.4								Palet (6) Redistors 2 coats	Palet (6) Redistors 2 coats	Paler (6) Redistors 2 coats	P. STEE PET 109 Phase	Palet (b) Redistors 2 costs	Palet (6) Redistors 2 coats	Taler (6) Rediators - 2 coats	Taler (6) Badiators 2 coats	Faler (6) Badiators 2 coats	Palet (6) Redistors 2 coats	Paler (6) Redistors 2 coats	raics (6) Esdistors 2 costs  inh Pres per 100 Phase	rate price and contact and con
	Page 1 to 1 to 1 to 1 to 1 to 1 to 1 to 1 t	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1								Palet (6) Redistors - 2 costs	Palet (6) Estinguiste 2 colts  the pres pet 10b phate 9 19	Faler (6) Badiatore - 2 coats	Palet (6) Estistors 2 colts		Paler (6) Eddistore ? colfs	Palet (6) Badiators 2 coats  the pres per cob plate	Faler (6) Bediators - 2 coats	Faler (6) Balatore - 2 coats	rafer (6) Badiatore - 2 coats	rafer (6) Badistore - 2 coats	0   0   0   0   0   0   0   0   0   0	Paler (6) Redistors 2 coats
	Part of the fact o	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								Palet (a) Esdiators 2 coats	Paler (6) Estimotors 2 conts	Paint (6) Endistors 2 conts	Paler (6) Badiatore 2 coats	Paint (6) Redistors 2 costs	Tales (6) Badiators 2 coats	Palet (6) Esdiatora 2 coats	Traint (th Endiators 2 coats	Paint (b) Endiators 2 conts	Paint (6) Endistors 2 conts	Palet (6) Endistors - 2 coats	Palet (6) Estimoster 2 conte	Palet (6) Redistors 2 costs
		1									Palet (6) Redistors 2 coats		Palet (6) Redistors - 2 coats		Palet (6) Redistors - 2 coats	Taler (6) Rediators - 2 coats	Taler (6) Relators 2 coats					
The pres per 10P Blace	The property of the property o	The picts per 100 Rhd or	The pres per 10P Blace	int prep per top phase	int prep per top phase	The pice per 10 Physic	The pres per 100 payer	The pres pres for the pres pres pres pres pres pres pres pre	int pres per 100 ph.c.	Taint (h) Edistors 2 costs	Taint (b) Esdistars 2 coles	The superior of the section of the s				Taigt (b) Esdistars 2 coles	Taint (b) Esdistate - 2 colts	The second secon	The Statements and the Statement	The superior of the sedistate - 2 coats	The following and the following the followin	Taint (th Estinture 2 coats
127 lub pres per job phase 19 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9	127 lith price part job phase. 9 1 9 2 9 1 9 1 9 9 1 9 9 1 9 9 9 9 9 9	12 link price part job phase  13 19 15 15 15 15 15 15 15 15 15 15 15 15 15	127 lub pres per job phase 19 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9	Inh pres per job shire	Inh eree ser tob share	Inh pres per job share	Inh pres per job physe	Inh pres per job physe	Inh pres per job shire		Talist (h) Endintuis - 2 coats	Tain (a) Estimates 2 colls	The second of th	Thirt (b) Edition - 2 colfs	Tain: (b) Ediziate: 2 colis	Taint (h) Edistate 2 colls	Taint (h) Eddistates 2 casts	na man managementa bergamman interpretation interpr	na man management properties and seed of the properties of the pro	Taigr (6) Edistant - 2 calis	Taint (h) Esdistate - 2 costs	Taliat (h) Eddinters - 2 colts
-77 lub area aer iob abise 9 1 9	The pres set isb share 9 1 9  1	27 July pres per job physe . 9 1 . 9	-77 lub area aer iob abise 9 1 9	the preparation below.	the present of plate.	the pres set of shies.	lub eres ser job shase	the pres set of shire.	lub eres ser job shire.	Taigt (b) Esdinors 2 conts	Taint (b) Estinair	Tablet (4) Esdinors 2 conts	raint (h) Redistors - 2 costs	na na namenina by projection inc.  1 projection inc.  2 projection inc.  2 projection inc.  2 projection inc.  2 projection inc.  2 projection inc.  2 projection inc.  2 projection inc.  2 projection inc.  2 projection inc.  2 projection inc.  2 projection inc.  3 projection inc.  4 projection inc.  5 projection inc	reside (4) Estatoire - 2 costs	Talice (b) Estinore 2 conts	1 py gammin net net net net net net net net net ne	Talier (b) Redistors 2 conts	Tablet (4) Estinors x conts	Taigt (4) Esdinors 2 conts		
177 lith price set igh phase 9 ! 9	1. 1 lith price part (all phase)	127 lith price and tab phase	177 lith price set igh phase 9 ! 9	int prep set tot phate	int prep per ich phate	int pres set ist share	int pres set ist share	ieb pien net iab phase	lith pres net job shave	The commerce of the contract o	The commerces of the co	And the state of t	The commerces of the co	An opening of a second of a se	The commerce of the commerce o	The commerces of the co	mi committee de la committee d		mi committe de la com	The comments of the comments o	And other section of the section of	And the second of the second o
-27 Jub stes set iob shate	1. 9 19 1. 1. 9 19 1. 1. 9 19 1. 1. 9 19 1. 1. 9 19 1. 1. 9 19 1. 1. 9 19 1. 1. 9 19 1. 1. 9 19 1. 1. 9 19 1. 1. 9 19 1. 1. 9 19 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1. 1. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2.	-27 Jub stes set iob shate	tub eres ser iob share	tich pres per ich phase	tub etce ect tob share 9 ! 4	tich pres per ich phase	tub step set tob phate	dut pres per iob phase	The committee of the co	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	THE COMMUNICATION OF THE COMMU	THE COMMENTS OF STATE	THE COMMENS OF THE CO	THI COMMISSION OF A STATE OF THE STATE OF TH	201	201 Comment of 4	20	THE COMMENT OF STREET OF S	The second of th	THE COMMISSION OF THE COMMISSI	20 Care Care Care Care Care Care Care Care
17 lub prop per job phase 9 1	127 July prop per job phase 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9	127 July prep per job phase 19 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9 1 9	17 lub prop per job phase 9 1	Inh eres ser tob share  Inh eres ser tob share  19 1. 9  19 2. 9  19 3. 9  10 4. 9  10 5. 10 9  10 5.	lub erce est job ebase 9 1 9 9 1	lub eres est job ebase 7 ; . 9 ; . 9	lub erce est job ebase	lub eres est job shase 7 casts	lub erce eer job ebase	The demonstration of the second secon	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THE COMMENTS OF THE COMMENTS O	10 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1	20 C C C C C C C C C C C C C C C C C C C	20 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THE COMMISSION OF THE COMMISSI	THE COMMUNICATION OF THE COMMU	The demonstration of the second secon	The demonstration of the second secon	20	1 D 5 50 motors in at 1 D 5 50 motors in at
Paler (th Baliners - 2 conte	Paler (4) Bedistors 2 coate  27 int pres ser iot phase  28 int pres ser iot phase  29 int pres ser iot phase  20 int pres ser iot	Paler (4) Bedistore 2 coate  27 Into pres per job phase  28 Into pres per job phase  29 Into pres per job phase  29 Into pres per job phase  20 Into pre job phase  20 Into pre job phase  20 Into pre job phase  20 Into pre job	Paler (th Baliners - 2 conte	the pres set ish shire. 2 cante the pres set ish shire	int pice set ist phase	let pres per 19th shire	int pice set ist phase	lub pres per 10b physe	int pres ser ist share	THE COMMISSION OF THE COMMISSI	MI COMPANY OF THE PARTY OF THE	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	THE COMMISSION OF THE COMMISSI	THE COMMENTS OF THE PARTY OF TH	And Comments of the Comments o	THE COMMISSION OF THE COMMISSI	31 Own 1 Own 2 Own	## 1	1	1	THE COMMISSION OF THE COMMISSI	THE COMMENTS OF STATE
Paler (4) Eddinors - 2 conts  -27 lub pres per 10b phase  -9 1 9  -9 1	Palet (6) Bediators - 2 coats  10 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Pales (a) Badiators - 2 coats  19 19  19  19  19  19  19  19  29  29  39  49  49  5	Paler (4) Eddinors - 2 conts  -27 lub pres per 10b phase  -9 1 9  -9 1	Inter (A) Badiature 2 coate  Jub prep per job phase  19 19  19  2 2 29  2 3 39	fult for Estitute - 2 coats fult pres set tob share	Jub step per job phase	fult fit Estitute - 2 coats fut pres set tob share	Jub stes set job shate	fult (6) Estinors - 2 conts  into pres set 10b Rhate  19 1 19	201 CHANGE CO. 1	Mil committee of the co	NI 10000 000 000 000 000 000 000 000 000	THE COMMAND OF STREET	201 October 201 - 12 - 12 - 12 - 12 - 12 - 12 - 12	THE COMMENT OF SEC.	201 Comment of 60 a	THE COMMITTEE OF THE CO	THE COURSE OF STATE O	21 COMPANY OF THE PARTY OF THE	NI 101010 000 000 000 000 000 000 000 000	201 COMMISS OF 10 TO THE TOTAL PROPERTY OF T	201 CHARLES 145 6
17 lub prop per lob phase 9 1	Paler (a) Badiatore - 7 capts  27 lub prep per job phase - 9 1, 9 2, 9 2, 19 2	Paler (a) Badiatore - 7 coats  27 lub eres per 10b share  29 1, 9 1, 9 1, 9 1, 9 1, 9 1, 9 1, 9 1,	17 lub prop per lob phase 9 1	Inh eres ser tob share  Inh eres ser tob share  19 1. 19 11. 19 12. 19 13. 19 14. 19 15. 19 15. 19 16. 19 17. 19 18. 19 1	Inh pres per job share	induction and and an area of the print of th	Inh prep per job phase 9 19	induction and and an area of the principle of the princip	Inh prep per job phase	201 CHARLES 2-0	THE CONTROL OF THE PROPERTY OF	201 COMMUNICATION OF 1-4	20 10 10 10 10 10 10 10 10 10 10 10 10 10	Mai committee of the co	THE CONTROL OF S	THE CONTROL OF THE PARTY OF THE	THE CHARGE OF TH	201 Consultation (1) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10 00 00 00 00 00 00 00 00 00 00 00 00 0	201 COMMON OF 1-0	201 commet 10 0	THE CHARGE OF STATE O
Paler (6) Estinors - 2 conts  177 July pres per 10 phate	Pality (b) Edizione 2 conte	Paler (6) Edizione 2 conte	Paler (6) Estinors - 2 conts  177 July pres per 10 phate	into felt Bediators 2 coats  into pres per job phase  1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9 1.9	int prepared to plate.	integrated for Bedinger - 2 coats integrated for Bedinger - 3 in a second	into pres ser into phate	interest of selection 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Faler (6) Bediators - 2 coats in prep per iop phase - 9 : -9 : -9	THIL COMM 657 C-D G	701 (State of 2 & 0	an transfer to	PRI (1988) 10 6 0 0	mit desenies 4.0 4	Per change 60 d	Pit (1988) (1986)	The County of a	an transfer of	In transfer to	an freeze to a	Tell Colonies (4) 0	THE CHARACTERS OF C
Paler (6) Estintors - 2 cons.	Faler (6) Bediators - 2 coats 9 1 9  Indiators per industrial phase 9 1 9  Indiators per industrial phase 9 1 9  10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Palet (6) Bediators - 2 coats   Palet (6) Bediators - 2 coats   Palet (6) Bediators - 2 coats   Palet (6) Bediators - 2 coats   Palet (6) Bediators - 2 coats   Palet (6) Bediators   Palet (6) Bedi	Paler (6) Estintors - 2 cons.	Faler (6) Badiators - 2 coats  July pres per ich phare  19 1 - 3	Filet (6) Esdintors - 2 const	Friet (6) Badistore - 2 costs  July pres per 10b phase  10 1 10 10 10 10 10 10 10 10 10 10 10 10	Filet (6) Esdiators - 2 coats inh pres per ich Phate 9 : 9	Filer (6) Badiators - 2 coats  link pres per iok phate  . 9 1 9	Friet (6) Esdiatore - 7 coats inh prep per ich Phate	1	1										11	
Tales (6) Badiators - 2 coats  -27 inh eres set tobebase - 9 19		Tales (6) Balasars - 2 coass  -27 inh pres per igh phase	Tales (6) Badiators - 2 coats  -27 inh eres set tobebase - 9 19	Taler (6) Balatore - 2 coats  the pres per 10b phase	In the step set is plained.	Taler (6) Balistore - 2 coats  the pres per 10b phase	the size set is share	Faler (6) Estinors - 2 cons	Tales (b) Badiators - 2 coats  this area net tob phate													
				International Contents of the	raise feb Badiators 2 coats  in property of the particle part of particle part of particle part of particle part of particle part of particle part of particle part of particle particl	Paris (a) Eddiators 2 coats	raise feb Badiators 2 coats  into pres pef ich B	Inh pres per 10 phase 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	raise (a) Esdiators—2 coats  into pres per iot place  into pres per iot													
Paler (6) Estintors - 2 const.	127 July stree set 10k share  12. 1 July stree set 10k share  12. 1 July stree set 10k share  12. 1 July stree set 10k share  12. 1 July stree set 10k share  13. 1 July stree set 10k share  14. 15. 1 July street set 10k share  15.		Paler (6) Estintors - 2 const.	Fries (6) Badistors - 2 coats  tith area are is abase  3 1 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Paler (6) Badiatore - 7 coats	Filet (b) Balistore - 2 cons	Paler (6) Bediatore - 7 coats	Filer (6) Badistore - 2 conts  finh pres per ich phate 9 1 9	Paler (6) Bediatore - 7 coats    Paler (6) Bediatore - 7 coats													
Paler (a) Badiatore 2 coats  17 lib properties and 19 lib pales and 19 lib		Paler (a) Esdiators 2 coats  Paler (a) Esdiators 2 coats  Paler (a) Esdiators 2 coats  17 int pres per 10 Phare  18 1 2 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Paler (a) Badiatore 2 coats  17 lib properties and 19 lib pales and 19 lib	raist feb Endiators 2 coats  into Pres per 100 phase  into Pres per 100 phase  2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Paler (6) Badiatore - 2 coats	raise for galacter 2 coats  in the pres per 10 physe  in the pres per	Internation of the property of	Falst (a) Badiators 2 coats  into pres per 10 physe  into pres per 10 physe  10 physe	Pales (6) Badiatore 2 coats													
Pales for the Bedintors - 2 conts  Pales for the Bedintors - 2 conts	Paice (a) Edition   1   1   1   1   1   1   1   1   1		Pales for the Bedintors - 2 conts  Pales for the Bedintors - 2 conts	raice fel Editor 2 coate  in properties and particle place 2 coate  in properties and place 2 coate  in properties and place 3 coate	Palet (b) Edizione 2 colts  Pa	rates for the part of place. 2 costs.	Faler (6) Edizione 2 colic	Parameter of the parame	Faler (6) Edizon 114   1   1   1   1   1   1   1   1   1													
Palet (b) Ediators 2 coats  Palet (b) Ediators 2 coats  Palet (b) Ediators 2 coats  Palet (b) Ediators 3 coats  Palet (b) Ediators 3 coats  Palet (b) Ediators 4 coats  Palet (b) Ediators 5 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (c) Ediators 6 coats  Pa	Palet (6) Estimators	Palet (6) Estintents   Palet (6) Estintents	Palet (b) Ediators 2 coats  Palet (b) Ediators 2 coats  Palet (b) Ediators 2 coats  Palet (b) Ediators 3 coats  Palet (b) Ediators 3 coats  Palet (b) Ediators 4 coats  Palet (b) Ediators 5 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (b) Ediators 6 coats  Palet (c) Ediators 6 coats  Pa	Price (6) Estators - 2 cons  in	Interest of place of the property of the prope	Puler (6) Estators - 2 cons	raict feb gadiators 2 coats  in property of the place of	Pariet (6) Estatore 2 conce	raist (d) Ediators 2 coats  in property of the particle base (c) 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2													
Tales (6) Bediators 2 coats  -27 inh stee per 10b share  -29 inh stee per 10b share  -30 inh stee per 10b share  -	Pales   (4)   Eadintors = 2 consc.   1	Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint   Charles   Paint	Tales (6) Bediators 2 coats  -27 inh stee per 10b share  -29 inh stee per 10b share  -30 inh stee per 10b share  -	Paler (6) Estingents 2 conts (1) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Faler (6) Badiatore - 2 coats  inh pres per 10b phate  10 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Paler (6) Edizione - 2 conte	Faler (6) Badiators - 2 coats  full pres per 100 phate  110 pres per 100 phate	Paler (6) Badiatore - 2 coats	Faler (6) Badiators - 2 coats full pres per 100 phate													
Paler (a) Edizione 1 cole   Paler   Pa			Paler (a) Edizione 1 cole   Paler   Pa	PAIGE 161 Eddings 182    Paige 161 Eddings 182	integration of the property of	Paler (6) Estinoster 2 conts	rates for galators 2 coats  in part of place 2 coats  in part of place 2 coats  in part of place 2 coats  in part of place 2 coats	Paler (6) Badiators - 7 coats	rates for galators 2 coats  in property of the particle party of the property of the party of th													
Palific (6) Endintours 2 conts  Palific (6) Endintours 2 conts		Fuler (6) Bediatore 2 coats  -27 inh stee per ich share  -27 inh stee per ich share  -27 inh stee per ich share  -28 inh stee per ich share  -29 inh stee per ich share  -20 inh stee per ich share  -	Palific (6) Endintours 2 conts  Palific (6) Endintours 2 conts	Fries (6) Badiators - 2 coats  tinh pres per ich phase  1.9  1.0  1.0  1.0  1.0  1.0  1.0  1.0	Paler (6) Badiatore - 7 coats	Faler (6) Balistore - 2 costs  in bottomers  find pres per 10b phare  10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Paler (6) Badiatore 2 coats	Filet (6) Balistore - 2 cone	Paler (6) Badiatore 2 coats													
Paler (a) Esdiatore 2 coats  Paler (a) Esdiatore 2 coats	Palfit (6) Estintoria 2 conts  Palfit (6) Estintoria 2 conts	Palfit (6) Edizione and seminate  Paler (a) Esdiatore 2 coats  Paler (a) Esdiatore 2 coats		Physic Coalic		Phise - Cable		Physic College								-						
Pales (6) Badiators 2 coats  -27 lub sice set 10b share  -3 lub sice set 10	Pariett (6) Estintone   Pariette   Pariett	Pales (6) Estintore = 2 cone   Pales	Pales (6) Badiators 2 coats  -27 lub sice set 10b share  -3 lub sice set 10	1	Phase . 2 coats . 3 1 2 3 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	Physic . 2 Canter	Bhase	Physic Coasts	Phase													
Paler (6) Estators - 2 coars  Paler (6) Estators - 2 coars  - 27 July pres per 100 Bhave	Paler (a) Edition 2 colds  Paler (a) Edition 2 colds  Paler (a) Edition 2 colds  Paler (a) Edition 2 colds  Paler (a) Edition 2 colds  Paler (a) Edition 3 c	Palet (a) Estimate to a series of a series	Paler (6) Estators - 2 coars  Paler (6) Estators - 2 coars  - 27 July pres per 100 Bhave	1	1	1	1	1		1 1 1 1 1				1 1	1 1							
Palet (6) Estators - 2 coats  Palet (6) Estators - 2 coats  Palet (6) Estators - 3 coats  Palet	Paler (6) Estatore Costs  Paler (6) Estatore Costs  Table (6) Estatore		Palet (6) Estators - 2 coats  Palet (6) Estators - 2 coats  Palet (6) Estators - 3 coats  Palet		1	1 to general in the second of	1	1	1					1 1								
False from Siret 1  Talet fel Badiators 2 coats  Talet pres per job place  1.9 1.9	Palific (6) Estimators of the properties of the	Pality Bres met 100 Phate 7 coats 9 1 2.	False from Siret 1  Talet fel Badiators 2 coats  Talet pres per job place  1.9 1.9		1				Physic 19													
Considered from Since; 1  Tales (a) Badiators - 2 coats  Tales per job place  17 lith pres per job place  19 1 19  10 10 10 10 10 10 10 10 10 10 10 10 10 1	Tales (a) Badiators - 2 coats  Pales for a since 1  The first of a badiators - 2 coats  The first of a	Considered from Since; 1  Paler feb Endiators 2 coats  Paler feb Endiators	Considered from Since; 1  Tales (a) Badiators - 2 coats  Tales per job place  17 lith pres per job place  19 1 19  10 10 10 10 10 10 10 10 10 10 10 10 10 1	Phase	1	Phase	1	Phase	1													
Tour lanced from Siret 1  Tales (h) Balistose - 2 coats  Tales	Falfor (6) Endiators - 2 coats  Palfor (6) Endiators - 2 coats	Falfor (6) Endinger - 7 conts  Falfor (6) Endinger - 7 conts	Tour lanced from Siret 1  Tales (h) Balistose - 2 coats  Tales	1	1	1	1	1														
Failer (6) Essistants  Pailer (6) Essistants  Pailer (6) Essistants  -27 inh pres per igh phare  -3 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -5 inh pres per igh phare  -6 in	Paler for Siret 1  Paler for Sir	Tollier of from Siret 1  Palet (a) Edition of from	Failer (6) Essistants  Pailer (6) Essistants  Pailer (6) Essistants  -27 inh pres per igh phare  -3 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -5 inh pres per igh phare  -6 in	1	1	1	1	1														
Pales - Sheet (2) Continued from Since 1  The first (b) Endintors - 2 conts  Pales (b) Endintors - 2 conts  The pres per 10 phase - 9 1 2	Table 1 Can Since (2)  Continued from Since 1  Faler (4) Endiators 2 conts  Table (4) Endiators 2 conts	Table - Sheet (2)  Continued from Sacet 1  Table (4) Endintote - 2 conts  Table Pres per job phase - 3 conts  The Pres per job phase - 3 conts	Pales - Sheet (2) Continued from Since 1  The first (b) Endintors - 2 conts  Pales (b) Endintors - 2 conts  The pres per 10 phase - 9 1 2	1	1	1	1	Physic 2 (2015)	Physics 12 colds.													
Fain Sheet (2) Continued from Sacet 1  Continued from Sacet 1  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 3 conte  Paic. (6) Edizion. 3 conte  Paic. (7) Phase  Paic. (8) Phase  Paic. (9) 1 29	Continued from Sacet 1  Continued from Sacet 1  Faler (a) Endiators 2 conts  The Pres per job phase 2 conts  The Pres per job phase 3 conts  The Pres per job	Continued from Sacet 1  Continued from Sacet 1  Faler (a) Badiators 2 costs 2  17 lith pres ser job shire 2 costs 2  18 lith pres ser job shire 2 costs 3  19 lith pres ser job shire 2 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 4 costs 3 costs 3  10 lith pres ser job shire 4 costs 3	Fain Sheet (2) Continued from Sacet 1  Continued from Sacet 1  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 3 conte  Paic. (6) Edizion. 3 conte  Paic. (7) Phase  Paic. (8) Phase  Paic. (9) 1 29	1	1	Phys. C 0215.	1		Physic . 2 cante													
Continued from Sacet 1  Continued from Sacet 1  Palet (a) Endiators 2 conts  Palet (b) Endiators 2 conts  Palet (c) Endiators 2 cont	Continued from Sinct 1  Continued from Sinct 1  Faler (6) Badiators 2 costs 2  17 lub prop per job physe 2 costs 2  18 lub prop per job physe 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 3 1 3 3 3 1 3 3 3 1 3 3 3 1 3 3 3 1 3 3 3 1 3	Continued from Sinct 1  Continued from Sinct 1  Palet (6) Badiators 2 costs  27 lub pres per job phase 2 costs  28 lub pres per job phase 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Continued from Sacet 1  Continued from Sacet 1  Palet (a) Endiators 2 conts  Palet (b) Endiators 2 conts  Palet (c) Endiators 2 cont		Physic 2 cante	1	Physic 2 can c	1	Physic													
Continued from Siret 1  Continued from Siret 1  Palit (6) Estintors - 2 conte  - 27 into pres per 10b phate	Continued from Siret 1  Continued from Siret 1  Palet (a) Badiators - 7 coats   1	Continued from Siret 1  Continued from Siret 1  Talet (6) Redistors - 2 costs  Talet (7) Redi	Continued from Siret 1  Continued from Siret 1  Palit (6) Estintors - 2 conte  - 27 into pres per 10b phate	1	1	1	1		1													
Continued from Siret 1  Continued from Siret 1  Falia (h) Edizione - 2 conc  Falia pres sef (c) Phate - 3 conc  17 inh pres sef (c) Phate - 3 conc  18 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  10 inh pres sef (c) Phate	Continued from Siret 1  Continued from Siret 1  Talet (6) Redistors - 2 costs  Talet (6) Redistors (6) Talet (6) Tale	Continued from Siret 1  Continued from Siret 1  Talet (a) Redistant - 2 costs  Talet (b) Redistant - 3 costs  -37 lub stree set tob share  -39 1 2 39  -39 1 2 39  -30 1 2 39	Continued from Siret 1  Continued from Siret 1  Falia (h) Edizione - 2 conc  Falia pres sef (c) Phate - 3 conc  17 inh pres sef (c) Phate - 3 conc  18 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  10 inh pres sef (c) Phate	1	1   1   1   1   1   1   1   1   1   1	1	1   1   1   1   1   1   1   1   1   1		1													
Continued from Sinct 1  Continued from Sinct 1  Falia (h) Ediziona 2 cont  Falia prep per 10 Phate	Continued from Siret   1	Continued from Siret 1  Continued from Siret 1  Faliat (h) Bediators - 2 coats  -27 lub stee set ich share  -3 lub stee set ich s	Continued from Sinct 1  Continued from Sinct 1  Falia (h) Ediziona 2 cont  Falia prep per 10 Phate	1	1	1	1	1	1													
Continued from Sinct 1  Continued from Sinct 1  Falia (h) Ediziona 2 cont  Falia prep per 10 Phate	Continued from Siret   1	Continued from Siret 1  Continued from Siret 1  Faliat (h) Bediators - 2 coats  -27 lub stee set ich share  -3 lub stee set ich s	Continued from Sinct 1  Continued from Sinct 1  Falia (h) Ediziona 2 cont  Falia prep per 10 Phate	1	1	1	1	1	1													
Continued from Sinct 1  Continued from Sinct 1  Falia (h) Ediziona 2 cont  Falia prep per 10 Phate	Continued from Siret   1	Continued from Siret 1  Continued from Siret 1  Faliat (h) Bediators - 2 coats  -27 lub stee set ich share  -3 lub stee set ich s	Continued from Sinct 1  Continued from Sinct 1  Falia (h) Ediziona 2 cont  Falia prep per 10 Phate	1	1	1	1	1	1													
Continued from Siret 1  Continued from Siret 1  Falia (h) Edizione - 2 conc  Falia pres sef (c) Phate - 3 conc  17 inh pres sef (c) Phate - 3 conc  18 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  10 inh pres sef (c) Phate	Continued from Siret 1  Continued from Siret 1  Talet (6) Redistors - 2 costs  Talet (6) Redistors (6) Talet (6) Tale	Continued from Siret 1  Continued from Siret 1  Talet (a) Redistant - 2 costs  Talet (b) Redistant - 3 costs  -37 lub stree set tob share  -39 1 2 39  -39 1 2 39  -30 1 2 39	Continued from Siret 1  Continued from Siret 1  Falia (h) Edizione - 2 conc  Falia pres sef (c) Phate - 3 conc  17 inh pres sef (c) Phate - 3 conc  18 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  10 inh pres sef (c) Phate	1	1   1   1   1   1   1   1   1   1   1	1	1   1   1   1   1   1   1   1   1   1		1													
Continued from Siret 1  Continued from Siret 1  Falia (h) Edizione - 2 conc  Falia pres sef (c) Phate - 3 conc  17 inh pres sef (c) Phate - 3 conc  18 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  10 inh pres sef (c) Phate	Continued from Siret 1  Continued from Siret 1  Talet (6) Redistors - 2 costs  Talet (6) Redistors (6) Talet (6) Tale	Continued from Siret 1  Continued from Siret 1  Talet (a) Redistant - 2 costs  Talet (b) Redistant - 3 costs  -37 lub stree set tob share  -39 1 2 39  -39 1 2 39  -30 1 2 39	Continued from Siret 1  Continued from Siret 1  Falia (h) Edizione - 2 conc  Falia pres sef (c) Phate - 3 conc  17 inh pres sef (c) Phate - 3 conc  18 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  19 inh pres sef (c) Phate - 3 conc  10 inh pres sef (c) Phate	1	1   1   1   1   1   1   1   1   1   1	1	1   1   1   1   1   1   1   1   1   1		1													
Continued from Siret 1  Continued from Siret 1  Palit (6) Estintors - 2 conte  - 27 into pres per 10b phate	Continued from Siret 1  Continued from Siret 1  Palet (a) Badiators - 7 coats   1	Continued from Siret 1  Continued from Siret 1  Talet (6) Redistors - 2 costs  Talet (7) Redi	Continued from Siret 1  Continued from Siret 1  Palit (6) Estintors - 2 conte  - 27 into pres per 10b phate	1	1	1	1		1													
Continued from Siret 1  Continued from Siret 1  Palit (6) Estintors - 2 conte  - 27 into pres per 10b phate	Continued from Siret 1  Continued from Siret 1  Palet (a) Badiators - 7 coats   1	Continued from Siret 1  Continued from Siret 1  Talet (6) Redistors - 2 costs  Talet (7) Redi	Continued from Siret 1  Continued from Siret 1  Palit (6) Estintors - 2 conte  - 27 into pres per 10b phate	1	1	1	1		1													
Continued from Sacet 1  Continued from Sacet 1  Palet (a) Endiators 2 conts  Palet (b) Endiators 2 conts  Palet (c) Endiators 2 cont	Continued from Sinct 1  Continued from Sinct 1  Faler (6) Badiators 2 costs 2  17 lub prop per job physe 2 costs 2  18 lub prop per job physe 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 3 1 3 3 3 1 3 3 3 1 3 3 3 1 3 3 3 1 3 3 3 1 3	Continued from Sinct 1  Continued from Sinct 1  Palet (6) Badiators 2 costs  27 lub pres per job phase 2 costs  28 lub pres per job phase 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Continued from Sacet 1  Continued from Sacet 1  Palet (a) Endiators 2 conts  Palet (b) Endiators 2 conts  Palet (c) Endiators 2 cont	Physic 2 (4315)	Physic 2 cante	1	Physic 2 can c	1	Physic													
Fain Sheet (2) Continued from Sacet 1  Continued from Sacet 1  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 3 conte  Paic. (6) Edizion. 3 conte  Paic. (7) Phase  Paic. (8) Phase  Paic. (9) 1 29  Paic. (9) 1 29  Paic. (10) Phase  Paic. (10)	Continued from Sacet 1  Continued from Sacet 1  Faler (a) Endiators 2 conts  The Pres per job phase 2 conts  The Pres per job phase 3 conts  The Pres per job	Continued from Sacet 1  Continued from Sacet 1  Faler (a) Badiators 2 costs 2  17 lith pres ser job shire 2 costs 2  18 lith pres ser job shire 2 costs 3  19 lith pres ser job shire 2 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 3 costs 3  10 lith pres ser job shire 4 costs 3 costs 3  10 lith pres ser job shire 4 costs 3	Fain Sheet (2) Continued from Sacet 1  Continued from Sacet 1  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 2 conte  Paic. (6) Edizion. 3 conte  Paic. (6) Edizion. 3 conte  Paic. (7) Phase  Paic. (8) Phase  Paic. (9) 1 29  Paic. (9) 1 29  Paic. (10) Phase  Paic. (10)	1	1	Phys. C 0215.	1		Physic . 2 cante													
Pain ther (2) Continued from Sacet 1  Touristanced from Sacet 1  Paint (b) Endintors - 2 conte  Paint (b) Endintors - 2 conte  Touristance and top Phate - 9 1 29 1 29 1 29 1 29 1 29 1 29 1 29	Continued from Sacet 1  Continued from Sacet 1  Faler (a) Endiators 2 conts  Table from per job phase 2 conts  The pres per jo	Table - Check (2)  Continued from Sacet 1  Continued from Sacet 1  Falex (6) Endintore - 2 conts  -77 (in) Pres per 10 habse - 3 1 2 3 1 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Pain ther (2) Continued from Sacet 1  Touristanced from Sacet 1  Paint (b) Endintors - 2 conte  Paint (b) Endintors - 2 conte  Touristance and top Phate - 9 1 29 1 29 1 29 1 29 1 29 1 29 1 29	1	1	Phis C C C C C C C C C C C C C C C C C C C	1	Physic 2 (4215)	1													
Pales - Sheet (2) Continued from Since 1  The first (b) Endintors - 2 conts  Pales (b) Endintors - 2 conts  The pres per 10 phase - 9 1 2	Table 1 Can Since (2)  Continued from Since 1  Faler (4) Endiators 2 conts  Table (4) Endiators 2 conts	Table - Sheet (2)  Continued from Sacet 1  Table (4) Endintote - 2 conts  Table Pres per job phase - 3 conts  The Pres per job phase - 3 conts	Pales - Sheet (2) Continued from Since 1  The first (b) Endintors - 2 conts  Pales (b) Endintors - 2 conts  The pres per 10 phase - 9 1 2	1	1	1	1	Physic 2 (2015)	Physics 12 colds.													
Pales - Sheet (2) Continued from Since 1  The first (b) Endintors - 2 conts  Pales (b) Endintors - 2 conts  The pres per 10 phase - 9 1 2	Table 1 Can Since (2)  Continued from Since 1  Faler (4) Endiators 2 conts  Table (4) Endiators 2 conts	Table - Sheet (2)  Continued from Sacet 1  Table (4) Endintote - 2 conts  Table Pres per job phase - 3 conts  The Pres per job phase - 3 conts	Pales - Sheet (2) Continued from Since 1  The first (b) Endintors - 2 conts  Pales (b) Endintors - 2 conts  The pres per 10 phase - 9 1 2	1	1	1	1	Physic 2 (2015)	Physics 12 colds.													
Continued from Siret 1  Continued from Siret 1  Falfat (6) Endintors - 2 conte	Table of from Siret 1  Table (a) Badiators 2 coats  Table (b) Badiators 2 coats  Table (c) Badiators (c) Bad	Continued from Since 1  Continued from Since 1  Faler (a) Badiators 2 coats  The pres per job phase 2 coats  The pres per job phase 3 coats  The pres per job phase 4 coats  The pres per job	Continued from Siret 1  Continued from Siret 1  Falfat (6) Endintors - 2 conte	1	1	1	1	1	1													
Palfor (6) Estinguistics 2 control  Palfor (6) Estinguistics 2 control  Palfor (6) Estinguistics 2 control  Palfor (6) Estinguistics 3 con	Paler for Siret 1  Paler for Sir	Total lawed from Since 1  Total lawed from Since 1  Total filt Endiators 2 conts  Total filt Pres per job place  Total filt	Palfor (6) Estinguistics 2 control  Palfor (6) Estinguistics 2 control  Palfor (6) Estinguistics 2 control  Palfor (6) Estinguistics 3 con	1	1	1	1	1	1													
Failer (6) Essistants  Pailer (6) Essistants  Pailer (6) Essistants  -27 inh pres per igh phare  -3 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -5 inh pres per igh phare  -6 in	Paler for Siret 1  Paler for Sir	Tollier of from Siret 1  Palet (a) Edition of from	Failer (6) Essistants  Pailer (6) Essistants  Pailer (6) Essistants  -27 inh pres per igh phare  -3 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -5 inh pres per igh phare  -6 in	1	1	1	1	1														
Failer (6) Essistants  Pailer (6) Essistants  Pailer (6) Essistants  -27 inh pres per igh phare  -3 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -5 inh pres per igh phare  -6 in	Paler for Siret 1  Paler for Sir	Tollier of from Siret 1  Palet (a) Edition of from	Failer (6) Essistants  Pailer (6) Essistants  Pailer (6) Essistants  -27 inh pres per igh phare  -3 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -5 inh pres per igh phare  -6 in	1	1	1	1	1														
Failer (6) Essistants  Pailer (6) Essistants  Pailer (6) Essistants  -27 inh pres per igh phare  -3 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -4 inh pres per igh phare  -5 inh pres per igh phare  -6 in	Paler for Siret 1  Paler for Sir	Tollier of from Siret 1  Palet (a) Edition of from	Foliationed from Siret 1  Foliationed from S	1	1	1	1	1														
Continued from Sinct 1  Thirt (6) Estintons and second sec	Pales from Sizet 1  Tourished from Sizet 1  Pales from sizet 1  Tourished from Sizet 1  Pales from sizet 1  Tourished from Siz	Fair full Edition Sizet 1  Pair full Erre per job phase	Continued from Sinct 1  Thirt (6) Estintons and second sec	1   1   1   1   1   1   1   1   1   1	1	1	1	1	1													
Taler (6) Badiatore - 2 coats  -27 lish prep per cab phate - 9 1 9	Palet (for Sizet )  Palet (for Edizion L. 2 conte )  Palet (for Ed	Palet for Sizet 1  Palet for Bediators 2 coats  Palet for Bediators 2 coat	Taler (6) Badiatore - 2 coats  -27 lish prep per cab phate - 9 1 9		1	1	1	1														
Tour lanced from Siret 1  Tales (h) Balistose - 2 coats  Tales	Falfor (6) Endiators - 2 coats  Palfor (6) Endiators - 2 coats	Falfor (6) Endinger - 7 conts  Falfor (6) Endinger - 7 conts	Tour lanced from Siret 1  Tales (h) Balistose - 2 coats  Tales	1	1	1	1	1														
Tour lanced from Siret 1  Tales (h) Balistose - 2 coats  Tales	Falfor (6) Endiators - 2 coats  Palfor (6) Endiators - 2 coats	Falfor (6) Endinger - 7 conts  Falfor (6) Endinger - 7 conts	Tour lanced from Siret 1  Tales (h) Balistose - 2 coats  Tales	1	1	1	1	1														
Tales (a) Badiators 2 coats  12 lub prepared from Sines 1  13 lub prepared (a) plates and (a) 1 9  14 lub prepared (a) plates  15 lub prepared (a) plates  16 lub prepared (a) plates  17 lub prepared (a) plates  18 lub prepared (a) plates  19 lub prepared (a) plates  19 lub prepared (a) plates  10 lub prep	Faler (6) Estinos Sicet 1  Faler (6) Estinos Esce 1  Faler (6) Estinos Esc 1  Faler (6) Estinos Esc 1  Faler (6) Estinos Esc 1  Faler (6) Estinos Esc 1  Faler (6) Estinos Esc 1  Faler (6) Estinos Esc 1  Faler (6) Estinos Esc 1  Faler (6) Estinos Esc 1  Faler (6) Estinos Esc 1  Faler (6) Estinos Esc 1  Faler (6) Estinos Esc 1  Fa	Faler (6) Estintone of the pressure of the pre	Tales (a) Badiators 2 coats  12 lub prepared from Sines 1  13 lub prepared (a) plates and (a) 1 9  14 lub prepared (a) plates  15 lub prepared (a) plates  16 lub prepared (a) plates  17 lub prepared (a) plates  18 lub prepared (a) plates  19 lub prepared (a) plates  19 lub prepared (a) plates  10 lub prep	Phase	1	Phase	1	Phase														
Tales (a) Badiators 2 coats  10 by gammes use  17 lub properties of abase  19 1 19	Tales (h) Badiators - 2 coats  Pales (h) Badiators - 2 coats  10 py gammin unit unit unit unit unit unit unit un	Palit for from Sacret 1  Palit (a) Endiators 2 conts  Palit (a) Endiators 2 conts  Palit (b) Endiators 2 conts  Palit (a) Endiators 2 conts  Palit (b) Endiators 2 conts  Palit (a) Endiators 2 conts  Palit (b) Endiators 2 conts  Palit (b) Endiators 2 conts  Palit (a) Endiators 2 conts  Palit (b) Endiators 2 conts  Palit (c) Endiators	Tales (a) Badiators 2 coats  10 by gammes use  17 lub properties of abase  19 1 19		Physic 2 (2215)	Pháse 2 3	1	1	1													
False from Siret 1  Talet fel Badiators 2 coats  Talet pres per job place  1.9 1.9	Palific (6) Estimators of the properties of the	Pality Bres met 100 Phate 7 coats 9 1 2.	False from Siret 1  Talet fel Badiators 2 coats  Talet pres per job place  1.9 1.9		1				Physic 19													
Paint feb Edizione Sinet 1  Paint feb Edizione - 2 conts  Paint feb Edizione - 3 conts  Paint fe	Table from Since 1  Table from the state of	Falst (6) Bediators - 2 coats  Falst (6) Bediators - 2 coats  Falst (6) Bediators - 3 coats	Paint feb Edizione Sinet 1  Paint feb Edizione - 2 conts  Paint feb Edizione - 3 conts  Paint fe		Bhase	1	a construction of the cons		Physic 1 1 2 casts			1 1 1 1	1 1 1			1 1						
Palet feb Sacet I me separate	Paler (a) Estation of the sacriful of the sacr		Palet feb Sacet I me separate	Physic	1	Physic California (1979)	Physic 2 can c		Physics 1.2 Call f					1 1								
Faler (6) Estintent of Phase  -27 inh pres per ich phase  -3 inh pres per i	Pales from affect to Blades  Pales from affec	Paler (a) Edizione 2 cole  Paler (a) Edizione 2	Faler (6) Estintent of Phase  -27 inh pres per ich phase  -3 inh pres per i		1	11 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -		1							1 1	1 1						
Paler (d) Badiatore - Coats  Paler (d) Badiatore - Coats  -27 lib area are job abase - 9 1 - 9	Parket (A) Badiatore	Falct (a) Esdiators 2 coats  Falct (a) Esdiators 2 coats  Falct (a) Esdiators 2 coats  17 inh Pres per ich Phase  18 inh Pres per ich Phase  18 inh Pres per ich Phase  19 inh Pres per ich Phase  19 inh Pres per ich Phase  19 inh Pres per ich Phase  19 inh Pres per ich Phase  19 inh Pres per ich Phase  19 inh Pres per ich Phase  19 inh Pres per ich Phase  19 inh Pres per ich Phase  10 inh Pres per ich Phase  10 inh Pres per ich Phase  10 inh Pres per ich Phase  10 inh Pres per ich Phase  10 inh Pres per ich Phase  10 inh Pres per ich Phase  10 inh Pres per ich Phase  10 inh Pres per ich Phase  10 inh Pres per ich Phase  10 inh Pres per ich Phase  11 inh Pres per ich Phase  12 inh Pres per ich Phase  13 inh Pres per ich Phase  14 inh Pres per ich Phase  15 inh Pres per ich Phase  16 inh Pres per ich Phase  16 inh Pres per ich Phase  17 inh Pres per ich Phase  18 inh Pres per ich Phase  18 inh Pres per ich Phase  19 inh Pres per ich Phase  19 inh Pres per ich Phase  10 inh Pres per	Paler (d) Badiatore - Coats  Paler (d) Badiatore - Coats  -27 lib area are job abase - 9 1 - 9	Phase	1 0 00 0000000 000 000 000 000 000 000	Phase	1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Phase	1							-						
Paler (a) Esdiatore 2 coats  Paler (a) Esdiatore 2 coats	Palfit (6) Estintoria 2 conts  Palfit (6) Estintoria 2 conts	Palfit (6) Edizione and seminate  Paler (a) Esdiatore 2 coats  Paler (a) Esdiatore 2 coats		Physic Coalic		Phise - Cable		Physic College								-						
Palist (6) Edizione - 2 conts  Palist (6) Edizione - 2 conts  Palist prep per 100 Phate - 9 : 19			Palist (6) Edizione - 2 conts  Palist (6) Edizione - 2 conts  Palist prep per 100 Phate - 9 : 19	Frier (6) Estimonton  Frier (6) Estimonton  (1) Frier (6) Estimonton  (2) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Price feb graduore 2 coats  into pres per co plass.  into pres per constant and and and and and and and and and and	Price (6) Estators - 2 cons	raist feb Endiators 2 coats into pres per 10 phase into pres per 10 phase  10 phase	Filet (6) Estintone 2 conc.	raise feb Esdiators 2 coats into pres per 10 phase into pre per 10 phase into pres per 10 phase into pres per 10 p							-						
Palet (6) Estimonous  Talet (6) Estimonous	Pales   Case		Palet (6) Estimonous  Talet (6) Estimonous	Paler (6) Estistant . 2 costs	Pales for selection of the selection of	In present to place of the first of place of the first of place of the first of place of the first of place of the first of place of the first of place of the first of place of the first of place of the first of place of the first of the f	Particular of the particular o	Tries (6) Balistors - 2 coats  in present in Palistors - 2 coats  in present in Palistors - 2 coats	Participants of the property o													
Paler (a) Edizione 1 cole   Paler   Pa			Paler (a) Edizione 1 cole   Paler   Pa	PAIGE 161 Eddings 182    Paige 161 Eddings 182	integration of the property of	Paler (6) Estinoster 2 conts	rates for galators 2 coats  in part of place 2 coats  in part of place 2 coats  in part of place 2 coats  in part of place 2 coats  in part of place 2 coats	Paler (6) Badiators - 7 coats	rates for galators 2 coats  in property of the particle party of the property of the party of th													
Paler (6) Estators - 2 coars  Paler (6) Estators - 2 coars	Paler (a) Edizione 2 conte	Palet (a) Edition of Palet (a) Palet	Paler (6) Estators - 2 coars  Paler (6) Estators - 2 coars	integration of the property of	Palet (b) Estatore 2 costs  Palet (b) Estatore 2 costs  Palet (b) Estatore 2 costs  Palet (c) Estatore 2 costs  Pa	integration of the property of	Palet (b) Edizione - 2 conte	Parison of the second of the s	Faler (6) Edizione - 2 conte													
12   114   Price per 10   Palizione   12   13   14   15   15   15   15   15   15   15	Pales (6) Estintore   Parentens   Parent		12   114   Price per 10   Palizione   12   13   14   15   15   15   15   15   15   15	Paler (6) Estators - 2 coars in part (9) Estators - 2 coars in pares per (9) Estators in pares p	Faler (6) Badiatore - 2 coats  Auth pres per ich phare  1.9 1.3	PAIGT (6) Eddiatore 2 coats  Into pres per 10 phase  Into pres per 10 phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  11 per parente into phase  12 per parente into phase  13 per parente into phase  14 per parente into phase  15 per parente into phase  16 per parente into phase  16 per parente into phase  17 per parente into phase  17 per parente into phase  18 per parente into phase  19 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase  10 per parente into phase	Faler (6) Badiatore - 2 coats  Auth pres per 10b phare - 3 coats	The first set at a base of the set at a	Faler (6) Badiatore - 2 coats  fully pres per 10b phate  1.9 1.9 1.9 1.9													
Faler (a) Esdiatore 2 coats  -7 lub properties per job phase -		Palici (d) Edizionia 12 conic Palici (d) Edizionia 2 conic Palici (d) Edizionia 2 conic 17 firb pres nel 10b Phate 9 1 1 2 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Faler (a) Esdiatore 2 coats  -7 lub properties per job phase -	Palet (a) Esdiators 2 coats    Palet (a) Esdiators 2 coats	Paler (6) Badiatore 2 coats	Price feb gradiators 2 coats  in page 100 phase  in	Paler (6) Badiatore 2 coats	Palet feb Esdiators 2 coats  in page 100 page 10	Paler (6) Badiatore - 2 coats													
Palfit (b) Ediziore - 7 cold (c) 10 Phate -	Faler (6) Bediators - 2 coats - 9 properties and man a		Palfit (b) Ediziore - 7 cold (c) 10 Phate -	Friet (6) Estistors - 2 costs  into pres per 100 phate  110 pres per 100 phate  20 1 20 10 20 20 20 20 20 20 20 20 20 20 20 20 20	Friet (a) Esdictors 2 coats  in the Pres per 10 plass  in the Pres per	Friet (6) Estatore - 2 cone	Price feb grainter 2 coats  in the pres per of place.  in the present of place.  in the p	Palet (6) Estators - 2 coats  lith pres per 10b phate - 2 coats  100 pres per 10b phate - 2 coats	raict (d) Edizior - 2 coata in the pres per of place of the pres per of place of the pres per of place of the pres per of place of the pres per of place of the pres per of place of the pres per of place of the pres per of the pres per of the present of the pres													
Public (6) Bediators - 2 coats - 9 1 . 9 1			Public (6) Bediators - 2 coats - 9 1 . 9 1	Paler (6) Estintore - 7 conts  lith pres per job place - 7 conts  Annual Control Contr	Particular of the particular o	Paler (6) Bediators 2 coats	Parameter of the parame	Paler (6) Estimators (2) 1 29 1 29 1 29 1 29 1 29 1 29 1 29 1	Parameter of the parame													
Pales for the Bedintors - 2 conts  Pales for the Bedintors - 2 conts	Paice (a) Edition   1   1   1   1   1   1   1   1   1		Pales for the Bedintors - 2 conts  Pales for the Bedintors - 2 conts	raice fel Editor 2 coate  in properties and particle place 2 coate  in properties and place 2 coate  in properties and place 3 coate	Palet (b) Edizione 2 colts  Pa	rates for the part of place. 2 costs.	Faler (6) Edizione 2 colic	Parameter of the parame	Faler (6) Edizon 114   1   1   1   1   1   1   1   1   1													
	Paint (b) Edizion   Paint (c)   Paint (c	Paint   10   Ending   10   10   10   10   10   10   10   1		Files Fire met 100 Phase	PLICE (6) Estinces of the property of the prop	integration of the property of	PLICE (6) Edizore 2 conce	integration of the property of	PLICE (6) Edizore 2 cone													
	Pales (a) Estimate numerous (a) (b) Estimate numerous (a) (b) Estimate numerous (a) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Paint   Charles   Paint   Pa		Paler (6) Edizors 2 colds  Paler (6) Edizors 2 c	Paler (6) Estators - 2 coars	Fig. (6) Edizione. 2 coata  in pres per job phase	Paler (6) Estators - 2 coats  lith pres per 10 phase - 2 coats	rice (6) Editor 2 coats  in property of the place of the property of the place of t	Paler (6) Estators - 2 coars  lith pres per 10 phase - 2 coars													
	Pales (a) Estimate numerous (a) (b) Estimate numerous (a) (b) Estimate numerous (a) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Paint   Charles   Paint   Pa		Paler (6) Edizors 2 colds  Paler (6) Edizors 2 c	Paler (6) Estators - 2 coars	Fig. (6) Edizione. 2 coata  in pres per job phase	Paler (6) Estators - 2 coats  lith pres per 10 phase - 2 coats	rice (6) Editor 2 coats  in property of the place of the property of the place of t	Paler (6) Estators - 2 coars  lith pres per 10 phase - 2 coars													
	Pales (a) Estimate numerous (a) (b) Estimate numerous (a) (b) Estimate numerous (a) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Paint   Charles   Paint   Pa		Paler (6) Edizors 2 colds  Paler (6) Edizors 2 c	Paler (6) Estators - 2 coars	Fig. (6) Edizione. 2 coata  in pres per job phase	Paler (6) Estators - 2 coats  lith pres per 10 phase - 2 coats	rice (6) Editor 2 coats  in property of the place of the property of the place of t	Paler (6) Estators - 2 coars  lith pres per 10 phase - 2 coars													
	Pales (a) Estimate numerous (a) (b) Estimate numerous (a) (b) Estimate numerous (a) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Paint   Charles   Paint   Pa		Paler (6) Edizors 2 colds  Paler (6) Edizors 2 c	Paler (6) Estators - 2 coars	Fig. (6) Edizione. 2 coata  in pres per job phase	Paler (6) Estators - 2 coats  lith pres per 10 phase - 2 coats	rice (6) Editor 2 coats  in property of the place of the property of the place of t	Paler (6) Estators - 2 coars  lith pres per 10 phase - 2 coars													
	Pales (a) Estimate numerous (a) (b) Estimate numerous (a) (b) Estimate numerous (a) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Paint   Charles   Paint   Pa		Paler (6) Edizors 2 colds  Paler (6) Edizors 2 c	Paler (6) Estators - 2 coars	Fig. (6) Edizione. 2 coata  in pres per job phase	Paler (6) Estators - 2 coats  lith pres per 10 phase - 2 coats	rice (6) Editor 2 coats  in property of the place of the property of the place of t	Paler (6) Estators - 2 coars  lith pres per 10 phase - 2 coars													
	Paint (b) Edizion   Paint (c)   Paint (c	Paint   10   Ending   10   10   10   10   10   10   10   1		Files Fire met 100 Phase	PLICE (6) Estinces of the property of the prop	integration of the property of	PLICE (6) Edizore 2 conce	integration of the property of	PLICE (6) Edizore 2 cone													
Paler (6) Estators - 2 coars	Paint   18   Badiature   2   19   1   2   2   2   2   2   2   2   2   2	Paler (a) Edition of Phase (a) Phase (a) Paler (a) Phase (a) Paler (a) Phase (a) Paler (a) Phase (a) Paler (a) Phase	Paler (6) Estators - 2 coars	Paler (a) Edition 2 coats  Paler (a) Edition 2 coats  Paler (a) Edition 2 coats  Paler (a) Edition 2 coats  Paler (a) Edition 3 c	Pales for 10 Phase 2 coase 10 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	rates and the principle of the principle	Palet (b) Edizione 2 conts  Pa	rates for galacter 2 costs  in property of the galacter 2 costs  in property of place 2 costs  in property of place 2 costs	Paler (b) Edizione 2 conts  Pa													
Paler (6) Endintere	Palet (a) Estimator and an appearance of the pres per iop plate . 2 coats		Paler (6) Endintere	rates for galaxies 2 costs  into pres per co place 2 costs  into pres per co place 3 costs  in	Fales for selections and selections are selections and selections are selections and selections are selections and selections are selections and selections are selections and selections are selections and selections are selections and selections are selections and selections are selections	Parameter of parameter of the parameter	Falce for godinators 2 coats  Falce for Badistors 2 coats  Falce for Badistors 2 coats  Falce for godinators 2 coats  Falce fo	P By Spinness 1888  PALET (6) Badiatore 2 coats  Inb pres per 10 phase	Paler (a) Endiators 2 coats  in pres net to phase 2 coats  in pres net to phase 2 coats													
Paler (a) Edizione. 2 colo.  Paler (a) Edizione. 2 colo.  Paler (a) Edizione. 2 colo.  Paler (a) Edizione. 3 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizio			Paler (a) Edizione. 2 colo.  Paler (a) Edizione. 2 colo.  Paler (a) Edizione. 2 colo.  Paler (a) Edizione. 3 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizione. 4 colo.  Paler (a) Edizio	Parameter of the galators of t	Particular and separation and separa	Particular of the galacore of coats and the particular of the galacore of the	rate per 10 phase 11st 11st 11st 11st 11st 11st 11st 11	Paler (6) Eddiators 2 coats	rates for go place. 2 coats.  in pres per job place. 2 coats.  in pres per job place. 2 coats.  in pres per job place. 2 coats.													
Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione (a) Edi			Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione (a) Edi	PAIGE OF BESTER OF STATES	rate per 14 Eadlature 2 coats  in property of the place 2 coats  in property of the place 3 coats  in property of the place 4 coats  in proper	Paler (6) Estinoster 2 conts	rate per (a) Estatore 2 costs  in property of the particle place 2 costs  in property of the place 2 costs  in property of the place 3 costs	Paler (6) Badiators - 7 coats	rate and the prince of the pri													
Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione (a) Edi			Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione (a) Edi	PAIGE OF BESTER OF STATES	rate per 14 Eadlature 2 coats  in property of the place 2 coats  in property of the place 3 coats  in property of the place 4 coats  in proper	Paler (6) Estinoster 2 conts	rate per (a) Estatore 2 costs  in property of the particle place 2 costs  in property of the place 2 costs  in property of the place 3 costs	Paler (6) Badiators - 7 coats	rate and the prince of the pri													
Paler (6) Edizione 2 colic 2 in 2 in 2 in 2 in 2 in 2 in 2 in 2	Paler (a) Esdiators 2 coats and an analysis an		Paler (6) Edizione 2 colic 2 in 2 in 2 in 2 in 2 in 2 in 2 in 2	International Control of the Property of the P	Paler (a) Editor 2 cole	Parameter and pa	Pariette met iop phase	P. De gaments test  Tales (a) Eddiators 2 colts  Inb pres per 10 phise  1	Parameter and separation and separation in the price and right places and													
Paler (6) Estators - 2 coars	Paint   18   Badiature   2   19   1   2   2   2   2   2   2   2   2   2	Paler (a) Edition of Phase (a) Phase (a) Paler (a) Phase (a) Paler (a) Phase (a) Paler (a) Phase (a) Paler (a) Phase	Paler (6) Estators - 2 coars	Paler (a) Edition 2 coats  Paler (a) Edition 2 coats  Paler (a) Edition 2 coats  Paler (a) Edition 2 coats  Paler (a) Edition 3 c	Pales for 10 Phase 2 coase 10 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	rates and the principle of the principle	Palet (b) Edizione 2 conts  Pa	rates for galacter 2 costs  in property of the galacter 2 costs  in property of place 2 costs  in property of place 2 costs	Paler (b) Edizione 2 conts  Pa													
Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione (a) Edi			Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione 2 cole  Paler (a) Edizione (a) Edi	International Control of the Prince of the P	Pales and separates and separates are separates and separates are separates and separates are separates and separates are separa	Page 1888 1888 1888 1888 1888 1888 1888 18	rate per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop place.  in person per iop per iop place.  in person per iop p	P. De gaments tax  Taxica (d. Eddiatora ? colic  inb. pres per 10 phise  1	rate per 10 physe 11 contains													
Paler (6) Estintors - 2 cons - 9 1 -	Pales   East	Pales   Separate   Pales   P	Paler (6) Estintors - 2 cons - 9 1 -	Pales for Selection of Selectio	Pariet (b) Estatore 2 coats  Pariet (b) Estatore 2 coats  Pariet (b) Estatore 2 coats  Pariet (b) Estatore 2 coats	Pales per in physics 2 coats in the pres per in physics in the pres per in physics 2 coats in the present	Palet (b) Estatore 2 coats  Palet (b) Estatore 2 coats  Palet (b) Estatore 2 coats  Palet (c) Phate 2 coats	Pales per of place of the pales	Palet (b) Estatore 2 coats  Palet (b) Estatore 2 coats  Palet (b) Estatore 3 coats  Palet (c) Phate 3 coats													
Pales (6) Bediators 2 coats  -27 lub sice set 10b share  -3 lub sice set 10			Pales (6) Bediators 2 coats  -27 lub sice set 10b share  -3 lub sice set 10	Paler (6) Balatore - 2 coats  lith pres per 10b phase  1.9  1.9  2.5  2.5  2.5  2.5  2.5  2.5  2.5  2	Interest (a) Baliziore - 2 coars	Paler (6) Badiatore 2 coats into pres per 10 phase 2 coats	Interest (a) Badiatore - 2 coats    Part   (b) Badiatore - 2 coats	Paler (6) Badiatore 2 coats	Tales (b) Badiators 2 coats  this area per ich phase 2 coats  this area per ich phase 2 coats													
Paler (a) Esdiators 2 coats	Palet (a) Estintole   Palet (a) Estintole	Palici (d) Ediziore 2 conte	Paler (a) Esdiators 2 coats	Palet (a) Esdiators 2 coats  Palet (a) Esdiat	Paler (a) Estintonia (a) (a) (a) (a) (a) (a) (a) (a) (a) (a	Palet feb Esdiators 2 coats  into pres net tob Phate  into pres net tob Phate  2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Inh prepared on the parameter of the prepared on the parameter of the para	Price feb gradiators 2 coats  into pres per cob phase  into pre per cob phase  into pres per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into pre per cob phase  into p	PAIGT (6) Ediators 2 coats													
Palist (b) Ediators 2 coats  Palist (b) Ediators 2 coats  Palist pres set tob Phate 9 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Paign (6) Estintors = 2 cons   Paign (1)	Palist (6) Estinguistate	Palist (b) Ediators 2 coats  Palist (b) Ediators 2 coats  Palist pres set tob Phate 9 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Paler (6) Estators - 2 const  Inh pres per 10b phase  10c	Friet (a) Endictors 2 conts  first pres per 10 phase 9 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Palet (6) Estatore 2 conte	Price (a) Esdicior. 2 coats  into pres per co plass.  into pres per control preserved.	Palet (6) Estatore 2 conce	Price feb Endiators 2 conts  into pres per cot place  into pres per cot													

FIGURE 8-1 (6 of 6) Job Phase Calculation Sheet (NAVFAC 11014/23)

Appendix E(4)

#### Instructions For Completing The Job Order Form (NAVFAC 11014/22)

Refer to the attached copy of the form 11014/22 and 22A for the corresponding blocks described below.

<u>Block 6.</u> PRIORITY- This is the priority designator assigned by the PWO or MCD.

<u>Block 9.</u> EQUIPMENT- Enter the plant account no., minor property no., or local station assigned no.

<u>Block 10.</u> RPI CAT. CODE (Real Property Inventory Category Code)— Enter the cat. code as shown on the plant account records. These codes are found in the NAVFAC P-72, Naval Facility Category Codes.

Block 11, COST ACCOUNT CODE- Enter the applicable data from the NAVCOMPT Manual, Vol. 2.

<u>Block 16.</u> FOR FURTHER INFORMATION, CALL- Enter the name of the person to be contacted if a problem arises.

Block 21, ESTIMATE-

- (1) WORK BREAKDOWN. This part is a small continuation sheet used for jobs that have only one or two shops and where the work description can be completed in the allotted space.
- (2) ESTIMATE SUMMARY. Entered here is each work center listed on the work authorization with summary figures for labor hours, labor dollars, material dollars, and the total cost estimate. The totals are indicated on the bottom line. EPS estimates are used where possible.

#### NAVFAC 11014/22A- INSTRUCTIONS FOR PREPARATION

<u>Block 3.</u> JGB PHASE NUMBER- All jobs are phased; that is, each shop has listed only that portion of work which can be done before another shop must do another phase.

<u>Block 4.</u> WORK CENTER- The work center no. or an abbreviation is entered here for the center doing that particular phase.

Block 5. DESCRIPTION- The job phase description is entered here as written in <u>BLOCK 6</u> of the Job Phase Calculation Sheet, Appendix E(3). Statements must be clear and concise in detailing the scope of work. Statements such as "accomplish work as required" or "see Fred Flintstone for work scope" are not acceptable. The shops must know what is to be done and not kept guessing.

STALL PREJAME BOOR AND JAME (BO NOT INSTALL SHOE HOLD AT THIS TIME) INSTALL 11/2" MASTE LINE TO MATER COOLER, COMMECT TO EXISTING MASTE WENT STACK IN ATTIC. INSTALL 1/2" COLD MATER SUPPLY LINE TO COOLER, COMMECT TO SUPPLY LIME IN CRAM, SPACE. INSTALL VALVE AT COOLER END. CUTLET BOXES FOR FLUORESCENT LIGHTS AND MECEPTACLES, AND PULL VINES. INSTALL 2" STEAM SUPPLY AND 3/4" CONDENSATE LINES TO RADIATORS AND CAP 6ff ABOVE PLOOR. (CONSECT INTO EXISTING LINES IN CRAML SPACE) REMOVE (8) EXISTING INCAMBERCENT LIGHT FIXTURES AND 140" WIRE AND INSTALL 1/2" LA' LE GYP. BOARD, BASEDOARD, AND CEILING COVE ON NEM 1/2"s4"s8' GYP. BOARB, BASEBOARB, SHOE AND CEILING COVE--OME SIDE (STEEL PIPE). IMPOLATE 2" STEAM SUPPLY LINE AND FITTINGS (FIBER-LINE IN CRUM, SPACE. INSTALL 11/2" WENT AND COMMECT TO EXISTING PARTITION INGINE. INGINE CHAIR BAIL ON ALL INTERIOR WALLS. IN-CONSTRUCT A PARTITION 30' LONG, 12" MIGH, 2"x4" STUDS, 16" O-C, ONLY (LEAVE STUBS OPEN ON INSIDE OF NEW OFFICE SPACE FOR OTHER COMBUIT. INSTALL MEN (8) CIRCUIT BISTRIBUTION PAMEL, COMPUIT, INSTALL (18) PLUDRESCENT LIGHT FIXTURES, (6) RECEPTACLES AND GASS INGUALION USE COPPER TUBING. CRAFT WORK). 3 3 3 E Ĕ 3 ¥ <u>\$</u> 3 3 S 8 INSTALL ME. PARTITION, LIGHTIMS, FLOOR TILES, PAINT WALLS, ETC. FOR CONNERTIME EAST SIDE 34 MARENOUSE BUILDING NO. 14 INTO OFFICE SPACE FOR SUPPLY DEPARTMENT. \$0-001-84 124 **3** ž 8 3 ş 8 Š 300 SO ż 901 ွ = ż 00184 14 3 Ĕ E ķ BUILDING NO. 14 CONVERT EAST END FOR OFFICE USE. 0... MORE ALTHOUGH A "CONTROL TO MAKETTANKE MAKADEL MORE WANTED TO CONTROL TO CONT THE CONTINUATION SHEET 23 DefThetalion 1111 THE LANGE STREET OF LANGE STREET U.S. MAYA, STATION 17,16712,1993 25 255 JIN JONES ESTER 

ż

26•

4130 36.7

SO-001-EL

807XS

š

:

Work Authorization/Estimate FIGURE 5-2

¢.

2

16•

14

H. BET2

#### APPENDIX F

- F(1). JOB SCHEDULE
- F(2). WORK CENTER LABOR HOUR AVAILABILITY LOG
- · F(3). MASTER SCHEDULE BOARD

Appendix F(1)

Samueles NAV SOCIAL ING				1 COMMP7 798	27-007-04 BA 17				72420		
REP	PIRS TO BUILDING NO.	7?						70724 195	500	•	
	1 ,00 (1144)175	CINTER	V15	8/25	8/30	9/7		1C-10141	T		
SHORE FLOOR	WISTS, LEVEL	01	64	8							
STAUCTURE, AL	MACE BEAMS				1		1	Ī			
	MER AND WASTE WASTS	11	4			ų.				T	
COTTEN SYLLING	PRITERIALS AND ASSIST	32	44	4					T	T	
We 02 In SHORT	ng leveling and benin									1	
REPLACEMENT										Ī	i T
CONSTRUCT FOR	TIME MO CHUMA RATE	01	<u> </u>	56	,						
SET MO REINFO	RE										
POUR POSTINGS	AND CHUMIAS AND ASSET	R		36							
WOOD IN STRIP	Ana			~		-					1
EM_											
STRIMAY	CHADITEK	91	44	4	130	1			1		
	MIAT	82			16	32				1	
,	PLUTOUTE & PIPE	Ħ	4					i		1 .	
	LABOR	R	4	10	40	44		İ		1	
mer 1 or 1	10144 W	agailt Alfred	112/ 122	234	176	<b>304</b>					

The Job Schedule is prepared by the Master Scheduler.

- 1. Upon receipt of a job order to be mester scheduled:
  - a. Notes month scheduled on Shop Load Plan.
  - b. Completes items 1 thru 4.

a

- c. Lists components of job, in sequence to be accomplished, in item 5. Identifies Work Centers involved in item 6.
- d. Enters labor hours to be expended each week, until job is completed, in appropriate columns of item 7. Determines weekly labor hour requirements from job sequence and economical crew size.
- e. Totals labor hours for each Work Center for each week. Enters the weekly and cumulative job totals in item 9.
- f. Checks "Tentative Schedule."
- Upon notification that material is available and job is activated by Division Director:

- a. Researches the Work Contentable hour Availability Log (Figure 9-2); to determine the consecutive weeks in which sufficient Labor hours while be available in all Work Centers to perform the work without interruption. Enters these dates in item 7.
- b. Distributes copy to appropriate Branch Panagers for review prior to weekly scheduling secting.
- At weekly scheduling queting, collects all "Tentative" Job Schedules.
- 4. After weekly scheduling meeting:
  - Pakes necessary corrections, or prepares new job schedule.
  - b. Checks "Final Schedule" and crosses out "Tentative Schedule."
  - c. Distributes to appropriate Mork Center Supervisors, via Branch Manager, with Mork Center Schedule.

FIGURE 9-1
Job Schedule

Best Available Copy

WORK		FOR WEEK			1	ENDING	_
CENTER	9/9	9/16	9/23	$\Box$		11/25	12/2
VATLABLE LH	456	570	570			570	570 ⋅
O1 CARP.	160 120 40 44 364 Bal 92 32 32 12 440 Bal 10 24 464 Bal 8	160 120 43 86 409 Bal 161 144 553 Bal 17	88 80 157 63 388 Bal 182 52 440 Ral 130				,
VAILABLE LH		420	420 /			420	420
O2 Paint	56 23 115 37 231 Bal 106 46 58 335 Bal 1	200 64 8 24 295 Bal 124 80 48 424 Bal -4	200 150 350 Bai 70				•
AVAILABLE LH	144	160	180	$\prod$	7	180	180
04	48 73 121 Bal 23 19 140 Bal 4	84 24 36 144 Bal 36	54 40 94 Bal 86	3			
	<del></del>	<u> </u>	<b>\</b>	77	Γ		<u> </u>
AVAILABLE LI	456	570	570	$\blacksquare$	L	570	570
32 LABOR	161 8 48 36 248 Bal 208 152 57 457 Bal —1	120 8 74 60 762 Bal 308 100 48 60 470 Bal 100 52 28 550 Bal 20	40				
	Work		SURE 9-2 Hour Avails	ы11	Lty	Lag	

## Appendix F(2)

WORK				• •	FC	OR WE	EK					1	ENDIN	G		
CENTER			9/9		T -	9/16			9/23		Ц	(	11/	/25	12/	12
AVAILABLE	LH		456		<del> </del> -	570			570			)	57		57	0
O1 CARP.		160 120 40 44 364 32 32 32 12 440 24	Bal	97	144	Bal		52		182 130						
AVAILABLE !	LH		336			420			420				42	0	42	0
O2 PAINT		56 23 115 37 231 46 58 335		105	200 64 8 24 296 80 48 424	Bal Bal	124	200 150 350	Bal	70			•			
VAILABLE L	LH		144			180	7		180		Π	7	18	0	18	0
04		48 73 121 19 140	Bal Bal	23	84 24 36 144	Bal	36	54 40 94	Bal	86	3					
			_													
WATE ARE E			456			£70			E 70		H	$\vdash$	57	^	570	<u> </u>
AVAILABLE I	_	151	456		120	570		120	570		H	-	3/	-	3/1	J
32 Labor		8 43 36	Bal Bal	208	8 74 60 262 100 48 60 470 52		308 100	48 26 124 318 40 135	Bal Ral							
					550	Bal	20									

FIGURE 9-2
Work Center Labor Hour Availability Log

Appendix F (3)

# MASTER SCHEDULE BOARD

# AWAITING MATERIAL SECTION FOR WORK CENTER-CODES SEE ACTIVE SECTION

RECORD BOL		228	2 2 z	1				TOTA	N. L/460	RHOUR	S ESTIM	ATED			
SHOP CONTROL MANBER	DESCRIPTION	332	SOMETIED STANTONG PAND	at the sea	õ	62	30	<b>26</b>	"	73	15	21	ಜ	п	TOTAL
7242146	Hotell (1) Tonn Past Valuese LIR, Area No. 2	819					-	7.0	13		10			••	181
7242144	Metall Fore and Louvers N End Blog No 36	916			14	22	•			٠		36		12	124
7242148	Contr Car : Black Youll & Sheel Coor Blag No 56	<b>3</b> 17	911			20	<b>50</b>	12			•	٠,		20	וצי
7242151	Conversion of Berracia Bldg. No. 172	8/31			1320	387	3-3		367	8		795		694	3334
7242154	Repair Burnger System Bidge Nec. 104 105, 105	•			*										50
72421 <b>50</b>	Rehebiliste Colf Sterage Reem, Mesuheri	\$5			-	4				30		ю	'20	16	264
7242156	Move and Install 300-12" Water Ms. 1-K St.	t/16			×		30	108	24					234	411
7242181	Postace (1) Post & (3) Truss Ties - Bidg. No. 108	un			*						•			12	114
7242165	Remove & Install Roshing. Eaves & vent Pipe, Bidg. No. 107	8/31			126					24				24	174
		1				_									
															***************************************
<del></del>	LABOR HOURS AMALTING	<del>                                     </del>							-						

FIGURE 9-3
Master Schedule Board - Awaiting Material Section

### MASTER SCHEDULE BOARD

### **AWAITING SCHEDULING SECTION**

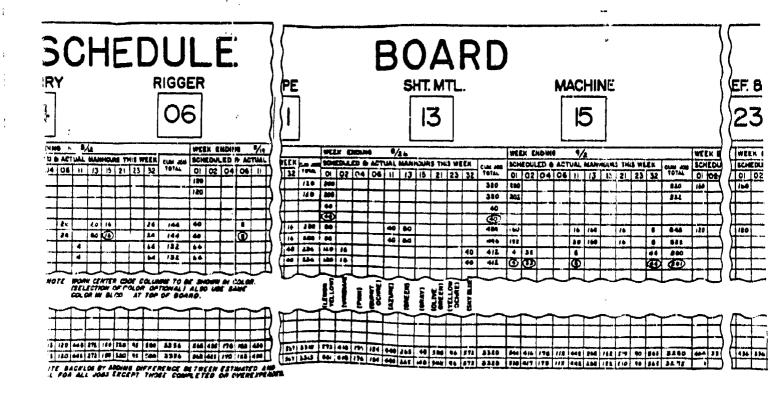
FOR WORK CENTER CODES SEE ACTIVE SECTION

		T		·	T										
JOB ORDER OR SHOP CONTROL	DESCRIPTION	# 65 € 8 6 8 8	COMMITTED STARTING DATE	PEMARKS				T	OTAL LA	BOR HO	URS EST	DETAMIN		_	
REBINUM	OCSUMP NOV	2 % 5	818 818 818 818	<b>F</b>	01	02	04	06	11	13	15	21	23	32	TOTAL
7242143	Penpheral Road Flood Repair	7/20			;									224	224
7242147	Alterations in Hallway Bldg. No. 8	8/10	-		32	32		24		24		35		8	155
7242150	Convert E End Storehouse	6/14			116	126			36			51		4	133
7242152	Install Overhead Crane Bidg. No. 62	6/16				16		32			94	40		16	198
7242153	Enlarge Doorwey to Recreation Room, Bidg. No. 42	8/17			52	8									60
7242156	Paint Extenor Bldg. No. 22	7/26			6	68									74
7242157	Construct & Install 3 Metal Degressing Tanks, Bldg. No. 62	7/27	9/27							86					88
7242160	Relocate Exaust Fans Dispensary	7/31			16	16						24		4	60
7242163	Replace Wooden Ramp by Concrete Ramp, Dispensary	8/18			80		117							40	237

		1								_			_	
TOTAL I SCH	ABOR HOURS AMAITING FEDULING BACKLOG			334	472	117	64	248	197	948	276	21	314	2141

FIGURE 9-4
Master Schedule Board - Awaiting Scheduling Section

								P	<b>V</b>		Δ		5	-	T		-	F	?				(	S		こ	<b> </b>	1			)	U	L		-
			ÇA	R	P.								P	ΑΙ	N	Γ					M	AS	ON	IR'	<b>Y</b>						R	IGG	ER		
WORK C COLOR	CODES =	\$\[	(										(	) )	2					٠		C	)4	7	•							06	3		
JOB CREEK OR SHOP			. 3	4	9	Ŧ	1	T										D A			T	-		NICH			G							CH C	_
CONTROL	DESCRIPTK	~	М	Ē	J.	Ī,		H			0					15		23	32	TOTAL	┥			04								CUM ACE		OZ	
7242012	Replace Sider		/	-	%				42		Ť	Ŧ	7	Ϊ	-				<u> </u>	928 522	SCHOOL	Ľ.	_		<u> </u>								120		Ľ
7212014	Secure Bidg		%		•	%		t	Œ.		+	#	#	7		_				<u>@</u>	\$040 40744				_			-					Ϊ.		_
7242015	Alterations Bidg No. 7		1/3	$\overline{}$	1/1			Ŀ	14	0 4	丰					<u>@</u>			72		90-073 ACTUAL				24		3.0	10			14 14	144	40	<u>                                     </u>	
7242032	Repair Heat 5 Bldg. No. 77	ide	7	7	1/2	_		Ŀ		Œ			4	Ž					1	(60) (80)	SCHE A	64				•		_			1 2 3	132	100		
	500,10.11			7				+	-	Ť	1	+	Ť	+			<del> </del>			GUD	BONE			├	<u> </u>	H	-	-			-		+	╁╌	-
									110	1	WAT NAT	144	HT (	POW	AS .	MPA	THE	# A	MT C	WITERS		_		Wa		BEL	A CI	OV (	2	N. PA	00	TIONAL )	ALD	0 11	*
$\sim$		$\cong$	$\supset$	1	$\supset$		$\leq$	7	$\cap$		1		1		1	/				$\sim$	TAC TO											$\sim$			
		-	0		701		ndec	胩	╀	┾	+	╀	+	+			<u> </u>		-	4	ACTUAL	_	H	_		_		ļ-	$\square$	_	Н		+	<del> </del>	-
		STIMAT	ED	14	<b>LANC</b>	WR	\$						0	101						11,050	1 20	172	4/9	103	120	4.	ETE	100	114	95	11.3	13 *6		425	
5 ACKLOG-	5 CALED LO ST. AL	AJOR J			_	10/2				144	-	31	78	25	786		[ ]	_	201	11,050	**		_	_			_			_		SE COM		EEA	_



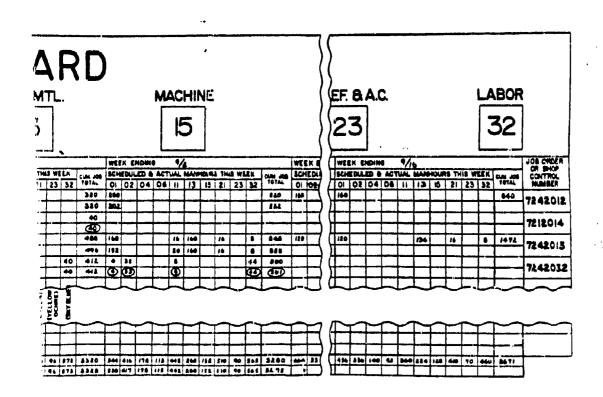


FIGURE 9-5 Mester Schedule Seard

APPENDIX G

REPORT REQUIREMENTS

(CHAPTER 10, MO-321)

#### REPORT REQUIREMENTS

- 1. PURPOSE. The tabulated and management reports shown are considered necessary to assist public works managers in controlling and measuring public works resources.
- 2. SUPPLEMENTAL TREND CHARTS. As a supplement to required management reports, activities are encouraged to develop and maintain trend charts to meet their specific needs. Examples of trend chart types developed and maintained by various activities, and suggested for consideration, are those showing productive effort, labor performance EPS, productive labor hour control, etc. One period's report does not provide complete information; it is only when information is drawn from successive reports that the management effectiveness of the work center, branch, division, or department can be determined. Reports do not, by themselves, exercise management control. Reports only provide facts needed by maintenance managers to pinpoint deficient areas that require corrective management action.
- 3. REPORTS ANALYSES. To become an effective management tool, reports must be analyzed to determine the true causes of individual index variations. Many variation condition corrections require firm management action. Each report analysis should contain a brief narrative statement outlining reasons for variations warranting reporting, or the lack of improvement. The required management action should also be noted.
- 4. OBJECTIVES. Following are Fecility Management reports objectives:

- a. Provide a source for determining variations from estimates on jobs, or phases of jobs, accomplished; and a basis for investigation, if such variations are beyond stated limitations.
- b. Inform management of each Branch's overall performance on all completed job orders.
- c. Inform management of the Maintenance and Utilities Divisions overall performance on all completed job orders.
- d. Inform management of the way in which each Branch has utilized its manpower during the report period.
  - f. Inform management of the type of work accomplished.
- 5. ACCURATE REPORTING. Obtaining accurate data is a problem not easily solved. Progress in obtaining more accurate reporting can be achieved by using the following procedures:
- a. Educating Work Center supervisors as to their responsibilities and their relation to overall management problems.
  - b. Prompt closing out all completed Job Orders.
- c. Assuring proper personnel craftsmen job time reporting through Periodic field checks.

- d. Maximizing EPS utilization.
- e. Acting quickly and firmly in all cases where improper reporting has been revealed.
- 6. REPORTS. All activities with 75 or more personnel in the Maintenance and Utilities Divisions combined will prepare Tabulated Reports A and B, and Maintenance/Utilities Labor Control Reports. Activities with 30, but less than 75 personnel, will also prepare these reports if they are using Engineered Performance Standards.
- 7. TABULATED REPORT "A" (TAB A) FEEDER FOR THE LABOR CONTROL REPORT. This is a monthly report (see Table 10-1) that provides information on labor hour expenditures by the various work categories in each Maintenance and Utilities Division Work Center and Branch. This is due within 10 working days after the last day of the period reported.
  - a. REPORT PREPARATION. The report is formatted as follows:
    - (1) Work Centers.
    - (2) Labor class codes.
    - (3) Actual labor hours for month.
    - (4) Actual labor hours fiscal year-to-date.
    - (5) Branch summary by labor class codes.
    - (6) Division summary by labor class codes.

NOTE: At smaller field activities where trade branches are not organizationally established, Work Centers should be combined with Branches.

- b. <u>DISTRIBUTION AND USE</u>. Two copies of this report will be distributed to the Work Management Branch, and one copy to any Branch or Division specified. The report informs management whether:
- (1) The maximum number of labor hours is being used in productive work categories.
  - (2) Labor hours used on overhead functions are reduced to a minimum.
- (3) A maximum number of labor hours are within the target range planned and programmed.
- (4) Basic data are available for compilation of the Maintenance/Utilities Labor Control Report.
  - (5) Detailed information is available for variance investigation.
- (6) Detailed Work Center information is available to program work and to help forecast labor hour availability in conjunction with Work Input Control and personnel utilization reports.
- 8. TABULATED REPORT "B" (TAB B) COMPLETED JOB ORDERS. This report (see Table 10-2 and Procedure Chart 9) provides final cost data on completed and cancelled job orders.

TABLE 10-1
Tabulated Report A, Feeder Report for Labor Control Report

Work Center	Labor Class Code	Actual Lahor Hours Honth	Actual Labor Hours-Fiscal Year-te-Da
11	01 02 03 04 05 06 07	74.9 13.4 115.0 59.6 218.7 175.3 788.2 1465.1	638.2 397.7 1438.9 752.6 1986.0 1942.5 7844.4 16122.3
	40 41 42 43 44 44	5, 5 152, 0 89, 6 38, 0 178, 0 483, 1 1946, 2	51, 2 1820, 0 732, 1 551, 0 1962, 0 5116, 3 21234, 0
12	01 02 03 04 05 06	79.0 16.0 61.0 495.0 51.6 113.0 437.6	831.2 194.6 754.2 215,6 3318.1 436.2 1830.2 9380.1
	40 41 42 43 44 45	120.0 94.6 45.0 129.0 180.6 1226.2	11, 2 1432, 0 736, 0 421, 8 1336, 0 4177, 0 13337, 1
Branch (A) Busmary	01 02 03 04 05 06 07	133,9 49,4 196,0 39,6 713,7 326,9 903,2 2302,7	1469,4 392,3 219,1 984,2 7304,1 2374,7,. 10994,6 23802,4
	40 41 42 43 44 43	5, 5 272, 0 184, 2 102, 0 307, 0 871, 7 3174, 4	82,4 3252,0 1308.1 952.8 3498.0 9293,3 34795,1
Maintenance Division Summary	01 07 03 04 05 06 07	369.0 218.6 394.0 421.0 2411.6 1896.4 6945.2 12875.8	3241,0 2002.1 3634.0 4437.2 23331.2 2070.4 73931.6 11664.9
	40 41 42 43 44 45	27.8 624.5 231.2 189.6 160.0 1452.0 2485.1	115,2 7211.4 1974.8 1434.0 1337.0 18334.2 30812.6 147462.1
Utilities Division Summary	01 02 03 04	79,0 38,7 104,6 29,5	#33.2 311.7 1312.2 347.2
	45	738.0 1279.3	9314.0 13321.4

TABLE 10-2
Tabulated Report B, Completed Job Order.

	Variation Total Cost	2.50 16.57 2.70 .04 17.93	5.47 11.14 .60 23.92 34.67	6.19 8.43 3.03 9.17	53.60 15.30 120.05 129.79	84.05 395.63 232.51 39.25 71.15 372.96 71.15
	Actual Total Cost	23.50 102.87 41.30 12.96 180.63	880.47 135.38 28.90 335.92 1380.67	66.81 70.13 44.35 181.29	759.10 210.70 275.05 1244.85	2898.41 6474.37 5217.51 2861.75 2521.15 17452.04 2521.15
ROZES	Estimated Total Cost	22 24 13	875 130 29 312 1346	73 62 43 175	735 226 155 1116	2915 6870 5205 2835 2450 17825 2455
COMPLETED JOB ORDERS	Actual Material Cost	5.05 20.15 11.15	361.27 27.12 3.65 30.83 412.87	21.05 13.85 9.16 44.06	172.25 59.95 49.33 281.53	1870   1819.66   1045   1078.73   1078.73   1078.73   1078.73   1078.73   1078.73   1078.73   1078.73   1078.73   1078.73   1078.73   1078.73   1078.73   1078.75   1079.75
-	Estimated Material Cost	2 12 12	36.4 7 28.	, 12 10 41 41 41	187 . 65. 30 282	1045 2580 1895 950 870 6470 870
TABULATED RE	Actual Zabor Cost	18.45 82.72 30.15 12.96 144.28	529.20 108.26 25.25 365.09	45.76 56.23 35.19 137.23	565.65 150.75 225.72 963.32	1819.68 4242.42 3200.00 1918.00 1630.00 11180.10 1630.00
PUBLIC WORKS DEPARTMENT TABULATED REPORT	Estimated Labor Cost	16 22 13 128	22 25 395 395	88 88 EEE	161 125 125 134	1870 4290 1310 1885 1580 11355 1580
WILL WORK	Actual Hours	8.5 39.8 14.9 8.0	252.0 52.3 12.12 186.3	22.0 27.7 17.1 66.8	283.5 74.3 110.1 467.9	758.2 1631.7 1280.0 959.6 652.0 652.0 652.0
	Estimated Hours	7 32 16 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	252 48 138 500	22 22 25 25 25 25 25 25 25 25 25 25 25 2	265 79 61 61	780 1650 1324 942 631 T 4696 I 631
	Job Order Rumber	7212010 7212010 7212010 7212010	724.2032 724.2032 724.2032 724.2032	7272036 7272036 7272036	7272062 7272062 7272062	TRADE MEANCH A TRADE MEANCH C TRADE MEANCH D TRADE MEANCH E           NAIR. DEV. SUMMAN
	Trade Branch or Flork Center	23 25 13	# # # # # # # # # # # # # # # # # # #	222	12 33 41	01 02 03 04 04 04 04 04 04 04 04 04 04 04 04 04

- a. REPORTING FREQUENCY. The report is prepared weekly or bi-weekly as necessary and includes completed and cancelled job order data. The cancelled job orders should be listed separately.
- b. PREPARATION. The report covers all specific and estimated standing job orders that have been reported to the fiscal office as completed or cancelled during the period covered by the report.

NOTE: The cost variance is not the difference between the estimated and actual total costs, but rather the sum of the labor and material variance. That is, if the labor variance is (-) \$500 and the material variance is (+) \$250, the cost variance is \$750, not \$250. Use an asterisk (\*) to differentiate manhours estimated with EPS from labor hours estimated with other methods. The totals in Part II should total both EPS labor hours and non-EPS labor hours if Engineered Performance Standards have been installed. (This is not reflected in Table 10-2). The upper part of the report shows information on each completed job order, by Work Center, with a total for each job order. Cancelled job orders are shown in the same manner in a separate list. The lower part of the report shows one line summaries for all completed job orders for:

(1) Each Trade Branch.

- (2) Maintenance Division.
- (3) Utilities Division.
- c. DISTRIBUTION. Distribute one copy each to the Work Management Branch, and the Directors of the Maintenance, Utilities, and Facilities Management Engineering Divisions.
- d. <u>USE OF REPORT</u>. This report provides data for preparation of NAVFAC 9-11014/30 (Figure 10-1) Variances on Completed Job Orders. See Paragraph 24 for lustructions on Lob Order Variation investigations.
- 9. LABOR PERFORMANCE INDICES. Data from Tabulated Report "B" are used to compute the Labor Performance Indices, items 22 and 23 of the Maintenance/Utilities Labor Control Report. To obtain the Labor Performance Index for Work Center, Trade Branch, or Division, divide the total estimated hours by the total actual hours for the period concerned.
- 10. MAINTENANCE/UTILITIES LABOR CONTROL REPORT, NAVFAC 9-11014/29. This monthly report (Figure 10-2) provides data on what was planned, actual results, and variances from the plan. This report also provides:
  - (1) A plan for full labor hour utilization within each trade branch.
  - (2) Yardsticks to measure plan effectiveness.
- (3) A means of comparing actual to accepted standards of personnel utilization.
- a. REPORT PREPARATION. Prepare this report on NAVFAC 9-11014/29 for each Trade Branch, a summary of Trade Branches within the Maintenance Division, and a summary of Trade Branches within the Utilities Division. When the Maintenance and Utilities Divisions are organizationally combined, separate

REPORT OR VARIATIONS ON CONFLETED JOG ORDERS  NAME: 1 4 ALLGUST 1984	REASON FOR VARIATION AND ACTION TAKEN	(1) and the comment of the control o		1602 CASPERTES Shop 250 200 400 Change in Scope of Job: Tailed to Regard	Asserdaced, where old siding Was	Bemoved, Evidence of Termite in-	destation nacessitated the Remova	of 250 to. FT of Sheathing and Studs	Instead at only Replacement	15 50 67 0+ 61 +1:-						CR. 21 - 4
PLETE		<u>.</u>	0 011 00CI CEO 0001	ani-												
83 85 85 85 85 85 85 85 85 85 85 85 85 85	T MECH	į.	. 8	Š												
RI AT 162	EST (MATE	9	282	D 50					,							
8 4	153 153		90	350												
0d3#	BRIEF DESCRIPTION OF JOB	2	REPAIR BUIDING # 14	WOOD CAPPEARE' Shop												
Marie A. Lichton Bearl	JOSE ORGER NO.	-	724184													

FIGURE 10-1 Report on Variations on Completed Job Orders

							MAINT	HANGE (	87V	L17168 15100
	/ S.	NAVAL STATION	AN	CWHE	3.5	•	X summ		<b></b>	NCH PEPORT
144	HEH HAME		<del>,</del>		32 £		. 1016 1746 1 ~ <b>. 건</b> 이	APril		784
ı	7.7		. CURR	NT MONTH A	أحاك كالمراج		EAR-TO-DATE	#		11
N.	CLASS CODE	CUNTROL ELEMENT	PL ANNED	ACTUAL	YAR I RAV	PL ANNED	ACTUAL	YAR I ANCE	0187.	ACCEPTABI RANGE
_	40	REWORK	0	0	0	0	0	0	0	0.3.0.4
	41	SUPERVISION	2350	2094	-256	26590	23470	-3120	45	6 . 7 , 6
╛	42	SHOP INDIRECT	1400	1532	- 68	16750	16671	- 77	3.2	5.45
4	43	ALLOWED TIME	1810	303	-507	18585	16575	-2010	3.2	2.34
싴	44	GENERAL OFFICE & CLERICAL	704	671	- 23	8244	7605	-639	1.5	1.5.2.5
4	48	LEAVE	10/20	10555	-85	68755	66923	-/372	2.7	14-18%
	TOTAL	. INDIRECT AND GVERNEAD MAN-HOURS	17/04	16155	-747	138724	131244	-7680	26.3	28.32%
	o i	SIRVIGE	6700	5737	-763	67770	62718	-5272	12.1	4 . 9%
	02	EMENGENCY WORK	2900	2445	-405	30375	29/57	-1278	5.6	1.5-2.5
<u>.</u>	69	DYNAMIC EQUIPMENT	106	157	57	4110	7866	- 244	0.7	1.8.3%
4	04	STANDING JOS ORDERS NOT ESTIMATED	2885	3/10	225	37410	10401	-5008	42	
4	08	ESTIMATED COTAMITES	7500	37/7	417	46250	4/12.4	-5621	2.7	
4	96	MINOR WORK	5788	4649	-1237	66294	52775	-/3299	10.2	<del></del>
}	-07	SPECIFIC JOB ORDERS	18551	14533	-4018	20/623	165374	-42297	3/.9	
	-		<del> </del> -	<u> </u>		<u> </u>				
	TOTAL	PRODUCTIVE HAM-HOURS	40624	34798	-5826	460647	38744/	72781	747	66-729
٥	CRANG TOTA	M. MAN-KOURS	T			59954				
1	PRODUCTIVE	[ EFFORT (Line 19/Line 20)		68.31			747			48 - 724
┿		FORMANCE - EPSE		96.			103 "			98 - 101
_,,,,	LABOR PERF	GRHANCE - HOM-(PS <sup>2</sup>		108 "			101 .			\$8-10!
٠ [ ;	PUPUPUPUPU BUSH-HAM	CONTROL 6-10-12-16-18-15	69.3"	66.8		70.51	67.7 "			40.45

FIGURE 10-2
Labor Control Report (NAVFAC 9-11014/29)

summaries based on Trade Branches performing primarily maintenance functions should be prepared. This report provides both planned and actual labor hour data and is presented in two parts, current month and fiscal year-to-date.

- (1) Planned. For the current month, this is the same information as is on the Workforce Availability Summary and Work Plan Summary for the current month. For fiscal year-to-date, add current month data to the previous month's fiscal year-to-date information.
- (2) Actual. For the current month, Tabulated Report A provides the information for lines I through 20. Fiscal year-to-date information is obtained by adding current month data to the previous month's fiscal year-to-date data.
- (3) Control Indices. The information on lines 21 through 24 is obtained as follows: Line 21 is obtained by dividing line 19 by line 20 and multiplying the result by 100 to convert to percent. Line 22 is obtained by dividing EPS-estimated hours on job orders by actual hours on the same work (the Completed Job Order Report contains this information) and multiplying the result by 100 to convert to percent. Line 23 is obtained by dividing non-EPS-estimated hours on job orders by actual hours on the same work (the Completed Job Order Report contains this information) and multiplying the result by 100 to convert to percent. Line 24 is obtained by dividing the total of hours for labor class codes 03, 05, 06, and 07 by line 19 and multiplying the result by 100 to convert to percent (labor class code 03 hours are include only to extent that the work was planned, estimated, and scheduled). Lines 21 and 24 are computed for both planned and actual hours; lines 22 and 23 are computed for actual hours only.
- (4) <u>Variance</u>. This is obtained by subtracting the planned hours from the antual hours. Therefore, a positive (+) variance means that the shops used more time that was estimated; a negative (-) variance means that the shops used less time than was estimated. Significant differences should be investigated to determine the causes.
- t. DISTRIBUTION. This report is distributed in sets. A set consists of one report for each trade Branch in the Maintenance and Utilities Divisions, one report summarizing all trade Branches in the Maintenance Division, and one report summarizing all trade Branches in the Utilities Division. The distribution is as follows:
- (1) One complete set each to the Public Works Officer or Assistant Public Works Officer, the Shops Engineer, the Director, Facilities Management Engineering Division and any public works component responsible for analysis.
- (2) A complete set of all trade Branches in the Maintenance Division and the division summary to the Director, Maintenance Division.
- (3) A complete set of all trade Branches in the Utilities Division and the Division summary to the Director, Utilities Division.
  - (4) One report of each trade Branch to appropriate Branch Managers.

- (5) Engineering Field Divisions of the Naval Facilities Engineering Command for special studies as requested. Such requests will be on a case basis for a definite period.
  - c. REPORT USE. The report can inform management whether:
- (1) The maximum number of labor hours is being used in productive work categories.
- (2) Labor hours used on overhead functions are realistic to the productive base.
- (3) A maximum number of labor hours are programmed on work input control charts and accomplished as approved.
- (4) Target Ranges for each supervisory level are being established, targets are being met, and corrective action taken where warranted.
- d. REPORT ANALYSIS. Except for overtime hours, the total labor hours shown for each Branch, Division or component on this report should be equivalent to the number of personnel shown on the Workforce Availability and Work Plan Summary.
- (1) Analysis of Productive Time. Analysis of productive codes (01 through 07) will assure that labor hours available for productive—type work are used efficiently. Analysis of productive time requires that many variables be considered. No fixed allowable percentage can be stated which will apply to all shops regardless of size or function. Target ranges are indicated for totals of all Branches (Maintenance and Utilities Divisions combined) with respect to total labor hours reported. These ranges are based on a Navy-wide "average" or "normal" condition, and must be used judiciously. The extent of contracting can influence the targets. Therefore, each supervisory level should establish a reasonable Target Range that can be met under local conditions. Each supervisory level then can readily determine if target ranges are being met, and where corrective action need be applied.

i,

(a) Emergency and Service Work. (Labor Class Codes O1 and O2). These classifications should be observed in relation to Preventive Maintenance Inspection (Labor Class Code 03). Keep labor hours in all three classifications to a minimum. For PMI, this means not accomplishing service order scope repair jobs under the guise of PMI. Change only true PMI work to this labor class code (03). A decrease in all three is a favorable trend. These three indices should also be watched for inter-relationship. A good Preventive Maintenance Inspection Program should reduce service and emergency work. A decrease in Service and Emergency work and no decrease, or an increase in Preventive Maintenance Inspection may indicate over-inspection. An increase in Service and Emergency work and a decrease in Preventive Maintenance Inspection may indicate under-inspection. An analysis of how much Emergency and Service work is being accomplished by the various Work Centers or Branches, should be made. If an Emergency/Service Work Center is established and is not performing 50 percent or more of the Labor Class Codes  $^{
m 0l}$  and  $^{
m 02}$  work, review the other Work Centers to ascertain which are doing relatively large percentages of the Emergency and Service work, and determine if some of this work could have been done by the E/S Work Center. By

concentrating as much Emergency/Service work as possible in the E/S Work Center, the other Work Centers are freed for additional programmed and scheduled work. However, judgment must be used because support shops, such as Sheetmetal and Machine Shops, do many small jobs independently as well as work for other Work Centers. These jobs require large and expensive equipment, and the transfer of such work to the E/S Work Center would require equipment duplication. In general, the E/S Work Center should be performing work requiring portable hand tools and equipment. Work requiring large shop equipment or special skills not available in the E/S Work Center, regardless of the size of the job, should be accomplished by the parent shop.

- (b) Productive Effort. The desirable percentage of productive effort to total labor hours for Maintenance and Utilities Divisions combined is in the range of 68 to 72. Although some variances should be expected during periods of abnormal leave, usually the summer months and December, any indices of less than 68 percent for protracted periods should be investigated for excessive overhead assignments.
- (c) Labor Performance. This provides an indicator of how well shop forces were able to meet allowed time for work that was planned, estimated, and scheduled. Labor performance may be monitored from information obtained from the Report on Variations on Completed Job Orders. Trends should be monitored. For example, if a current month's Branch performance is 96, performance would appear satisfactory. Conversely, an index of 85 would appear to require immediate corrective action. However, if the index of 96 is a steady drop from 99, and the 85 a steady rise from 75, the opposite would be true. Also, a performance rate of 90 on work amounting to only 30 labor hours is not as important to management as a 90 percent performance rate on work amounting to 3,000 labor hours.
- (d) Productive Labor Hour Control. he desirable percentage for the Maintenance and Utilities Division, separately or combined, is in the range of 80 to 85. Variances from this range should be expected in Work Centers such as Emergency/Service or Pest Control. Productive labor hour control shows the shop's total productive labor hour percentage expended on work that was programmed, planned, estimated, and scheduled. To help obtain maximum control, management should regularly review the Standing Job Orders Not Estimated percentage with a view of reducing it to the minimum.
- (2) Indirect and Overhead Labor hours. The desirable range of total Overhead to total Productive labor hours for Maintenance and Utilities Divisions combined is 28 to 32 percent. Although some variances from this range should be expected during periods of abnormal leave, any Maintenance and Utilities Divisions combined percentage higher than 32 for protracted periods should be investigated for excessive overhead assignments. For individual Work Centers and Branches the range is variable, depending upon the type of work accomplished. Work Centers with highly repetitive work such as janitorial, refuse, and trash collection, should have less than 28 percent. Only under unusual circumstances should a Work Center's overhead exceed 35 percent. Frequently a high overhead rate is caused by a dwindling productive workforce without a compensating adjustment in supervision.
- 11. REVIEW AND CORRECTIVE ACTION EACH SUPERVISORY LEVEL. Each Branch and Division supervisor is responsible for taking corrective action, where

warranted, on all planned work not completed as directed. The Work Input Control Charts reflect the planned column of this report, and Tabulated Report "A" reflects actual accomplishment. If a Branch or Division is not meeting provided plans, then the Branch or Division supervisor must take corrective action. Deficiencies noted and corrective action taken or recommended should accompany the Summary Report submitted to the Public Works Officer or Assistant Public Works Officer.

- 12. REPORT ON VARIATIONS ON COMPLETED JOB ORDERS, NAVFAC 9-11014/30. An analysis shall be prepared on NAVFAC 9-11014/30 (Figure 10-1) when variances on the Tabulated Report B, Completed Job Order Report meet the following criteria:
- a. On Work Centers, or jobs, totaling less than \$1,000, a variance of \$100 or more shall be investigated. Only that portion of the work accomplished by the Work Center primarily responsible for the variance will be investigated.
- b. On Work Centers, or jobs, totaling more than \$2,000 and less than \$10,000, a variance of 10 percent or more should be investigated. Only the portions of the work accomplished by a Work Center maying a variance of 10 percent or more than \$200 will be investigated.
- c. On Work Centers, or jobs, totaling more than \$10,000, a variance of live percent should be investigated. Only the portions of the work accomplished by a Work Center having a variance of five percent or more than \$200 will be investigated.
- a. INVESTIGATOR. The Public Works Officer should delegate authority and responsibility for variance investigation to a senior supervisor. The Work Management Branch or equiv lent function should coordinate the variance review.
- b. PROCEDURE. In the formal procedure the investigator designated as described in the preceding paragraph shall review each Tabulated Report B, Completed Job Order Report and determine which, if any, jobs have significant variances. A variance is considered significant if it exceeds the limitations shown in Paragraph 24, or if, in the opinion of the investigator, it represents an unhealthy trend in any work center. For each job with a significant variance, a Report on Variations on Completed Job Orders, NAVFAC 9-11014/30, shall be prepared. Findings will be reported in column 7, including any corrective action that has been taken or that the investigator recommends be taken to prevent recurrence in the future. Copies of the completed report are sent to the Director, Maintenance and/or Utilities Division (dependent on the shops involved), the Facilities Management Engineering Director and the Public Works Officer for their information and appropriate action. This is the appropriate procedure to use when Tabulated Report B, Completed Job Order Report is both accurate and timely. If this is not the case, another procedure may have to be used but variance analysis should be performed. One method is to have the shops identify the reasons for variation at the time the job is completed. The information is forwarded with the closeout copy of the job order. The best variance analysis occurs when the latter procedure is utilized.

- PRIOR ACTION. Certain personnel are in a position to identify and initiate action on variances or impending variances before preparation of the Tabulated Report B, Completed Job Order Report. The Master Scheduler should review the Planned and Actual labor hours on the Master Schedule and report any impending variance to the Facilities Management Engineering Division Director for action. The Work Center or Branch Supervisor should follow progress on all jobs and, on noticing any impending variance, take action to prevent or minimize the variance. If the variance cannot be prevented, a written record of the circumstances should be made for use by the investigator. The Work Center supervisor should log the actual hours used on all job orders.
- d. INVESTIGATION. If the job is over-expended, look for a change in job scope. Also look for poor planning, or poor job descriptions, by Planners and Estimators. It is also possible that Planners and Estimators estimated on the basis of a better method of accomplishment than that used by the shop. Among the causes of under-expenditures are loose estimates, improved methods, and changes on the job during performance (two coats of paint specified; one coat applied). Whatever the variance cause, the facts must be determined and appropriate action taken. Periodically, amendments should be investigated to assure that there is a true change in scope and that they are not being issued to make reports "look good".
- 13. BASE ENGINEERING SUPPORT TECHNICAL SYSTEM (BEST). (See Appendix L for greater detail). Activities implementing pertinent BEST modules should refer to installation materials to determine data available for review. The BEST system consists of management information modules to aid the PWO and his staff. Each of the seven modules provide techniques, procedures and control indicators for improved and effective management of facilities, maintenance, transportation, and utilities systems. The seven modules are:
  - a. Emergency/Service (E/S)
  - b. Shore Facilities Inspection (SFI)
  - c. Work Input Control (WIC)
  - d. Facilities Engineering Job Estimation (FEJE)
  - e. Transportation
  - f. Utilities
  - g. Family Housing

#### APPENDIX H

MAINTENANCE MANAGEMENT APPRAISAL QUESTIONNAIRE

#### 4. QUALITY ASSURANCE FOR IN-HOUSE OPERATIONS.

- assurance for contracting. Under the Commercial Activities (CA) Program, the government is obligated to operate under the same terms of the contract if done in-house. A feature of many in-house contract specifications are performance factors relating to quality and response. Even for non-CA work it is good business practice to monitor performance. For work items with performance factors, data should be collected and analyzed as if the work was accomplished by contract. A modified form of the Quality Assurance Flan prepared for a Facility Support Contract and detailed in MO-327 should be utilized. Since the inspection is for in-house personnel and the government, it is recommended that inspections be made on a bi-monthly or monthly basis unless persistent problem areas require more frequent inspections. Random inspection is a desirable method to assure objectivity and to assure sufficient readings are taken to accurately measure the desired performance.
- b. Organization. The Quality Assurance (QA) responsibilities will vary from activity to activity depending on the type of work remaining in-house. The Work Management Branch of the Facilities Management Engineering Division would be assigned in-house QA inspection responsibility. This in-house function would relate solely to performance factors, quality of end product, and responsiveness of service—not to direct supervision of the function. The end product would be specified in terms of quality, improved customer relationships, and cost effective services. Integrated with the Facilities Management Program, this function would provide management feedback for all key areas of public works effort.

# TABLE 11-1 (Section 1) MAINTENANCE MANAGEMENT APPRAISAL QUESTIONNAIRE Shore Facilities Inspection Function

	QUESTIONS	TARGET ANSWERS
1.1.	Does the Facilities Management Engineering (FME) Division Director maintain, or have access to, an up-to-date inventory of Class I and Class II property?	Yes
1.2.	Are all changes caused by new construction, demolition, etc., reflected on facility cards, or an acceptable substitute?	Ye s
1.3.	Is there a Control Inspaction Schedule?	Yes
1.4.	Are all facilities reflected on the schedule?	Yes
1.5.	Are Control Inspections on schedule?	Yes
1.6.	Are all Class II facilities inspected in accordance with the frequencies shown in	
	MO-322, Volume 1?	Yes

1.7.	Do Control Inspectors use appropriate inspection guides while conducting Control Inspections? (MO-322, Volume 2)	Yes
1.8.	Are the Facilities Management Engineering Division Director and Public Works Officer/ Assistant Public Works Officer aware of deficiencies in the inspection schedule (failure to provide a complete inspection of all facilities at least once per triannum)? (Suggested: FME Division - evaluate	
	monthly; PWO/APWO - evaluate quarterly)	Ye s
1.9.	Are corrective actions being taken to insure that the inspection schedule will be met? How frequently?	Yes Quarterly
1.10.	Are old inspection reports and job orders purged from facility inspection files after a new inspection has been conducted?	Yes
.11.	Do Planners and Estimators perform Control Inspections in addition to their normal duties?	Information
.12.	Are Preventive Maintenance Inspections scheduled?	Yes
13.	Is the Preventive Maintenance Inspection System administered by the FME Division?	Yes
1.14.	Is the PmI equipment inventory up-to-date?	∕tes
1.15.	Are PMI check-off cards or other adequate documentation maintained? Are they used by shop craftsmen performing the inspections? Are the inspection/check-off cards, with attendant craftsmen remarks, analyzed and/or reviewed?	Yes
1.16.	Are PMI standing job orders planned and estimated, and does the scope of work outlined adequately describe the equipment to be serviced?	Yes
1.17.	Are PM inspections on schedule?	Yes
1.18.	Are discrepancies revealed by PMI reported when the required maintenance is beyond PMI scope? How?	Ye s
1.19	Is there an Operator Inspection Program?	Yes

1.21.	Are measures currently in effect which are designed to minimize the number of miscellaneous or unscheduled inspections conducted by Control Inspectors and/or Planners and Estimators?	Yes
	rushacrors and/or transers and datimators;	162
1.22.	Is the Work Reception and Control function provided a copy of monthly Control Inspection and PMI schedules?	Yes
1.23.	Are tenants of facilities scheduled for Control Inspections advised in advance of forthcoming inspections, and are they encouraged to provide lists of known discrepancies?	Yés
1.24.	Do personnel receiving, approving and issuing Emergency/Service Work Authorizations screen all incoming calls which apply to facilities included on the Control Inspection Schedule and attempt to discourage service calls on facilities scheduled for inspection in the "near future"?	Y <b>es</b>
1.25.	What percent of the specific job order maintenance and repair work is generated by Control Inspection?	652
1.26.	Are inspection reports reviewed to determine items to be programmed for accomplishment; to be included as an essential unfunded deficiency; or deferred as desirable, but not essential?	Yes
1.27.	Is the Public Works Department organized in accordance with NAVFAC P-318, Organization and Functions for Public Works Departments?	Yes
1.28.	Is an organization chart and personnel listing available and maintained current?	Yes
1.29.	Is there a plan for cross-training Planners and Estimators in the FME Division and from Craftsmen from the Maintenance Division?	Yes
1.30.	Does the Public Works Department have a current training program?	Yes
1.31.	Are customers surveyed for response problem areas?	Yes
1.32	Is turn around time measured for customer work, priority work, routine work?	Yes
1.33	Is routine feedback provided to customers concerning status of jobs?	Yes

## TABLE 11-1 (Section 2) Work Input Control and Planning and Estimating Functions)

		<del></del>
ļ	OUT STT ONE	TARGET ANSWERS
	QUESTIONS	MANAKA
2.1.	Is an up-to-date station directive in effect which specifies the personnel authorized to request services from the Public Works Department, and does it provide a procedure for submitting work requests?	Yes
2.2.	Is <u>all</u> known Minor Work and Specific Job Order work programmed on the shopload plans and/or job requirements and status chart?	Yes
2.3.	Is there a short-range shopload plan? (1-3 months)	Yes
2.4.	Is there a long-range shopload plan?	Yes
2.5.	Is there a Workforce Availability/Work Plan Summary for a projected 3 month period?	Yes
2.6.	Is there a yearly Standing Job Order Summary, which includes labor hour estimates by work center, and labor and material dollar cost estimates programmed quarterly? Is the information concerning action to be taken, and frequencies, sent to the shops?	Yes
2.7.	What is the percent of Specific Job Order loading on the shopload plan? (Specific labor hours programmed vs total labor hours available. If Minor Work Authorizations are programmed on the shopload plan, include these job orders also).	
	Month 1 Month 2 Month 3 Month 4-12	100% 70-90% 60-80% 40-70%
2.8.	Is the work programmed on the shopload plan, and/or job requirements and status chart, in accordance with the OP-PLAN, resource availability, and annual maintenance plan?	Yes
2.9.	Does the Maintenance and the Utilities Division provide periodic (weekly and monthly) input to Work Management regarding jobs status, material	·
	availability, planned leave, etc.?	Yes

2.10.	Is there a joint meeting between Facilities	
	Management Engineering Division and Maintenance	
	Division personnel prior to final shopload plan	
	preparation (month one) to critically appraise	•
	and obtain a mutually acceptable and workable	
	shopload plan?	Yes
2.11.	Is the shopload plan reviewed and formally	
	approved by the PWO/APWO prior to its submission	
	to the Maintenance Division?	Yes
.12.	Are only the jobs reflected on the short	
	range (3 months) shopload plan released to the	
	shops for accomplishment? (Exceptions include	
	emergency-urgent jobs, or jobs requiring long	
	lead times for material procurement).	Yes
•	reed tymes for meferier brochrameur).	749
.13.	Are changes to the current approved shopload	
	plan (urgent jobs) controlled and approved by	
	the PWO/APWO?	Yes
		•
2.14.	Is the EPS Program installed?	Yes
.15.	Have all Planners and Estimators received initial	
	EPS training and/or been retrained in the	
	last two years?	Ye s
	and the laster	***
.16.	Have all Control Inspectors received initial	
	F'S training and/or been retrained in the	
	List three years?	Yes
	·	
2.17.	Has the Facilities Management Engineering	
	Division Director received initial EPS training?	Yes
.18.	Are copies of current Engineered Performance	
	Standards manuals available? Are copies of	
	current MO manuals available? (NAVFAC P-349	97 a
	provides listing of manuals with current changes)	Yes
.19.	What is the percent EPS utilization?	75% minimum
~	· · · · · · · · · · · · · · · · · · ·	
.20.	Were the jobs on the last month's shopload plan	
	accomplished as programmed; i.e., at least 90%	
	of the jobs scheduled were started, and at least	
	of the jobs scheduled were started, and at least 80% of the labor hours scheduled on the jobs started	
	80% of the labor hours scheduled on the jobs started	Yes
. 21	80% of the labor hours scheduled on the jobs started were accomplished as planned? If not, what percentages were started and/or accomplished?	Ye∌
.21.	80% of the labor hours scheduled on the jobs started were accomplished as planned? If not, what percentages were started and/or accomplished?  How many jobs on last month's shopload plan	
.21.	80% of the labor hours scheduled on the jobs started were accomplished as planned? If not, what percentages were started and/or accomplished?	Yes Information
	80% of the labor hours scheduled on the jobs started were accomplished as planned? If not, what percentages were started and/or accomplished?  How many jobs on last month's shopload plan were not started at all? Why?	
.21.	80% of the labor hours scheduled on the jobs started were accomplished as planned? If not, what percentages were started and/or accomplished?  How many jobs on last month's shopload plan	

ODI

and the same of

1

F-27

2.23.	What percentage of the maintenance force is assigned to standing job order effort? (Obtain from latest Maintenance/Utilities Labor Control	Variable dependent on what efforts
	Report, Division Summary FY To-Date, Labor Class Codes 04 and 05)	have been contracted
2.24.	Have all maintenance and repair projects been submitted, or are in process for early submission?	Yes
2.25.	How many job order amendments were written last month?	Information
2.26.	Are <u>all</u> job order amendments planned and estimated?	Yes
2.27.	Are <u>all</u> job order amendments issued in accordance with an established Public Works Department procedure?	Yes
2.28.	Is turnaround time measured (elapsed time from work receipt to work completion)? Does it appear reasonable?	Yes

### TABLE 11-1 (Section 3) Facility Maintenance Resources)

	QUESTIONS	TARGET Answer:
3.1.	What is the current annual planning figure for:	
3.2.	Ml (Maintenance and Repair) M2 (Special Projects) R (Minor Construction) Pl (Operations) L7 (Transportation) N (Utilities)  Is there an operating plan for each major	Information
	fund source:  Monthly?  Quarterly?  Annually?	Yes Yes Yes
3.3.	To what extent does the Public Works Officer control the current annual planning figures?	Total
3.4.	Is the FME Division Director formally advised of annual and quarterly planning figures and reimbursables to enable programming work to the Maintenance Division within fund limitations?	Yes

3.5.	Is the total identified workload, as illustrated on the job requirements and status chart, shop load plans, and standing job order summary, separated into groups by fund source?	Yes
3.6.	Has an annual maintenance plan been established?	Yes
3.7.	Have controls been established as a means of preventing funds over-obligation/over-expenditure?	Yes
3.8.	Are narrative reports prepared explaining trends and variances in planned versus actual performance?	Yes
3.9.	Are meetings held with division heads to familiarize them with the financial reports?	Yes
3.10.	What is the current plant replacement value (less family housing) of Class II property?	Information
3.11.	Are the items which constitute unfunded nondeferrable backlog noted on the job requirements and status chart, or an acceptable work input control chart?	Yes
3.12.	What percent of the nondeferrable backlog is supported by inspection reports?	100%
3.13.	What is the total val lated Nondeferable Backlog of Maintenance and Reyair (NMAR)?	Information
3.14.	Was the NMAR amount reduced during the last fiscal year? If reduced, by what amount? If increased, by what amount?	Information
3.15.	Is the PWO provided with maintenance unit cost information?	Yes
3.16.	Have Maintenance unit expenditures increased or decreased from last fiscal year?	Information
3.17.	What has caused changes in maintenance unit expenditures?	Information
3.18.	What percent of real property maintenance funds are used for alterations and improvements?	7.5% of Ml + R1
3.19.	Is there a station planning board to determine priorities of alterations and improvements?	Yes
3.20.	Do budget plans include maintenance of facilities not shown in the BFR (Basic Facilities Requirements)?	No

K r

Ľ

Chir-

3.21. Are quantities reported in the budget forms based on the quantities shown in the inventory of Military Real Property, NAVFAC P-164 as of the beginning of the past fiscal year, adjusted for planned additions, expansions or deletions?

Yes

#### TABLE 11-1 (Section 4) Shop Scheduling and Work Accomplishment Functions

	QUESTIONS	TARGET ANSWERS
4.1.	What is the percent of productive effort	
	(Maintenance Division)?	68-72%
4.2.	What is the labor performance?	eps/non eps
	Building Trades	95-105%
	Mechanical Trades	95-105%
	Electrical Trades	95-105%
	General Services	95-105%
.3.	Is the maintenance scheduler provided copies	
	of the short range shopload plan? (months 1-3)	Yes
4.4.	Is the maintenance scheduler provided a copy of the current personnel availability/work plan	
	summary?	Yes
4.5.	Is there a master schedule? Is it correlated	
	with the current shopload plan?	Yes
4.6.	Does the maintenance scheduler base the master	
	schedule on monthly shopload plans?	Yes
4.7.	Does the maintenance master scheduler program	
	work to each shop committing approximately 75%	
	of the shop forces "available" for Specific	
	Job Orders and Minor Work Authorizations?	Yes
4.8.	Is each Work Center supervisor provided with a	
	copy of the weekly schedule prior to the	
	beginning of each new work week?	Yes
4.9.	Does the Work Center supervisor prepare an	
	advance daily-work plan at the beginning of	
	each week using the weekly schedule as a basis?	Yes
4.10.	Are all Work Center personnel scheduled and	
	accounted for on work center schedules?	Yes

_		
4.11.	Are Work Center schedules correlated with the	- N
4.11.	master schedule (100% of jobs and hours on master	
	schadule for the week are also schaduled on	
	appropriate work center schedules)?	100%
	appropriate work center senenging,	100%
4,12.	Is work being accomplished on schedule?	Yes
4.13.	Does the Work Center supervisor appraise	
	schedule performance by comparing actual labor	
	hours expended deily with the daily work plan?	Yes
4.14.	Is the Work Center supervisor told what jobs are	,
	not to be worked when it becomes necessary to	
	accomplish jobs which were not scheduled	
•	(emergency or urgent jobs)?	Yes
		<del></del>
4.15.	Following job completion by a Work Center, is	
	the completed job returned to the Branch Manager,	
	or Maintenance Schedular, within 24 hours of	
	completion?	Yes
.16.	Are reasons for variances noted on completed job	
	orders by Work Center supervisors?	Yes
.17.	Are causes for schedule carry-over reconciled	
***/*	with the Master Scheduler as they occur?	V
	with the master Scheduler as they occur:	Yes
4.18.	Does the Work Center supervisor initiate action	
	to obtain amendments before the 33b sceeds the	
	estimated labor and material costs (oral	
	approval acceptable on urgent jobs in process)?	Yes
.19.	When amendments are requested, is it mandatory	
	that documented justification accompany the	
	request? Are any justifications unacceptable?	Yes
	•	
.20.	Are amendment requests reviewed and approved	
	by the Director, Maintenance or Utilities	
	Division prior to submission to the Facilities	
	Management Engineering Division Director?	Yes
.21.	Does the FME Director review and approve (on	
	recommend approval of) all amendment requests?	Yes
	•	***
.22.	Are all amended job orders so annotated?	Yes
.23.	Is there an Emergancy/Service Work Center?	Information
		9115 A # ME 1/ TA !!
.24.	What percent of the total Emergency/Service	
	workload is accomplished by the E/S Work Center?	50%

4.25.	What percent of the total Maintenance effort is expended on Emergency/Service work?	Variable - Analysis should be made to determine % at activity level
4.26.	Does the E/S Work Center perform work which is not Emergency/Service type work (LCC 03, 04, 05, 06, 07)? How much? Why?	Information
4.27.	Is the Emergency/Service Work Center staffed with proper crafts to facilitate efficient workload accomplishment? What crafts are needed?	Yes
4.28.	Are E/S truck radio dispatched?	Yes
4.29.	Is supply support responsive to need?	Yes
4.30.	Does public works have supply purchase authority? If not, would it improve responsiveness?	Yes
4.31.	Are material staging or storage areas adequate?	Yes
4.32.	Are surplus materials returned to supply promptly?	Yes
4.33.	Are on-hand supplies limited to 60 days?	Yes

#### TABLE 11-1 (Section 5) Management Reports Function

	QUESTIONS	TARGET ANSWERS
5.1.	Is the TAB "A" Report - Feeder for Labor Control Report - received on time? (Monthly; due 10 working days after the reporting period)	Yes
5.2.	Is the Tabulated "A" Report, Feeder Report for the Maintenance/Utilities Labor Control Report prescribed in NAVCOMPT Manual Volume 3, paragraph 037221, reconciled with the Workforce Availability Summary and Work Plan Summary prescribed in NAVFAC MO-321? Is the report accurate?	Yes
5.3.	Is the Maintenance/Utilities Labor Control Report received on time? (Monthly; due 15	
	working days after the reporting period)	Yes

5.4.	Is the Maintenance/Utilities Labor Control Report accurate?	Yes
5.5.	Is the TAB "B" Report - Completed Job Orders - received on time? (Weekly or bi-weekly; due 5 working days after reporting period)	Yes
5.6.	Is the TAB "B" report accurate?	Yes
5.7.	Is the Job Order Variance Investigation Report NAVFAC 9-11014/30 - prepared for jobs outside the accepted criteria?	Yes
5.8.	Are formal internal "feedback" reports required from appropriate Division Heads relative to corrective action taken in problem areas indicated by: Maintenance/Utilities Labor Control Report and Completed Job Order Report?	Yes .
5.9.	Is corrective action taken as recommended?	Yes

#### TABLE 11-1 (Section 6) Miscellaneous

	QUESTIONS	TARGET ANSWERS
5.1.	Are safety measures acceptable relative to OSHA requirements, e.g.:	
	Safety guards for equipment?	Yes
	Eye hazardous area clearly marked? Eve protective warnings observed by all	Yes
	employees? Flammable storage adequate, clean, and	Yes
	precautionary measures observed? Stripping for safety lanes and working areas	Yes
	in shops?	Yes
	Hearing protection used?	Yes
•	Asbestos handling (procedures & equipment)?	Yes
5.2.	Is work performed by the Maintenance Division	
	of acceptable quality?	Yes
6.3.	Is there a formalized system to measure quality?	Yes
6.4.	Are all working spaces clean?	Yes
6.5.	Are all working spaces adequately lighted?	Yes

6.6.	Does the shop equipment layout afford optimum work flow?	Yes
6.7.	Is shop space available?	Yes
6.8.	Does the office space layout afford optimum work flow?	Yes
6.9.	Is office space adequate?	Yes
6.10.	Is the end-use material staging area adequate?	Yes
6.11.	Is transportation readily available for:	
	Personnel to and from jobsites?  Material to jobsites?  Control Inspectors?  Planners and Estimators?  Shop Supervisors?	Yes Yes Yes Yes
6.12.	Do all pest control personnel have valid certificates, or only work under direct supervision of personnel with valid certification?	Ye s